MARITIME HERITAGE MINNESOTA

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Phase I Archaeological Reconnaissance of the Big Island Steamboat Pier, Park, and Veterans Camp Site (21-HE-402) Project Report

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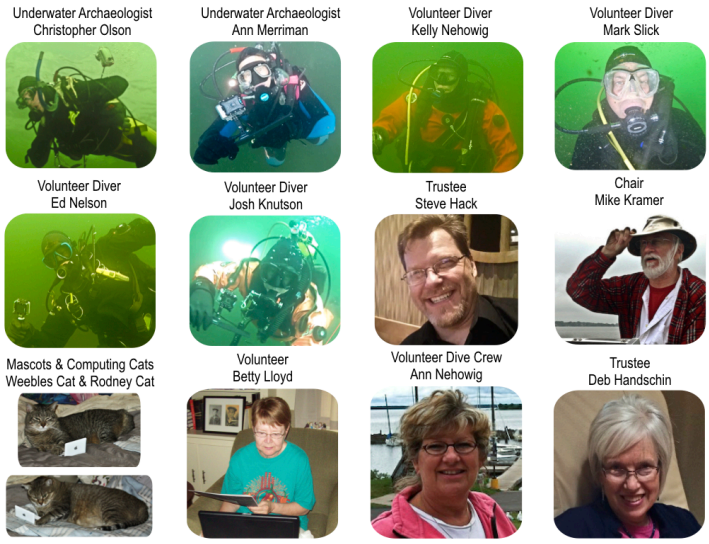
Cover Credits: L. S. Buffington Papers; Excelsior-Lake Minnetonka Historical Society; Hennepin County Library

Dedicated to MHM friend, the late Jim Ogland, the biggest fan of Big Island.

MHM



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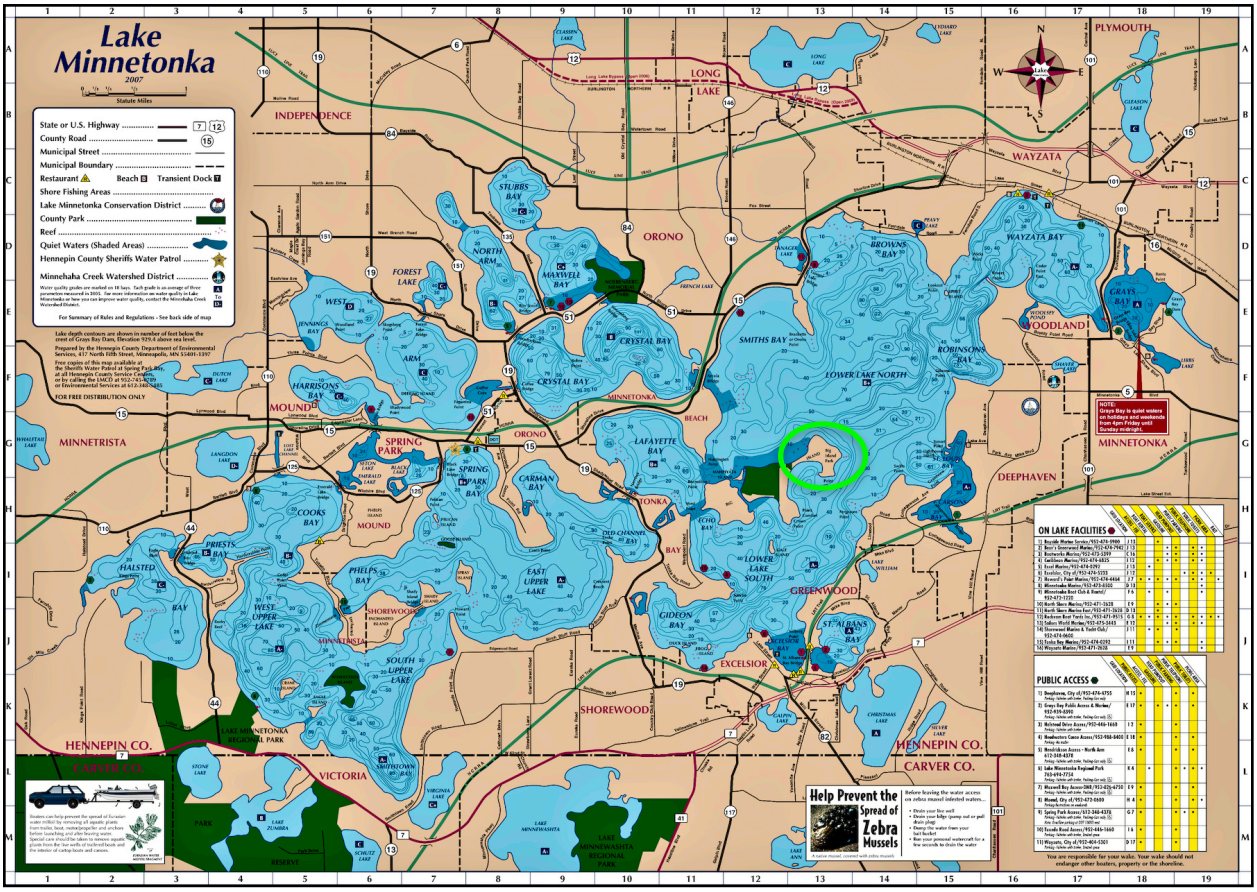
Introduction

At the request of the City of Orono, Maritime Heritage Minnesota (MHM) conducted the Phase I Archaeological Reconnaissance of the Big Island Steamboat Pier, Park, and Veterans Camp Site (21-HE-402) Project (2019-BI Project) in May-July, 2019. The purpose of the 2019-BI Project was to answer questions about Big Island's archaeological remains, with the most significant (yet basic) question being: What is the extent of the surviving archaeological features in the project area? With that premise in mind, initially MHM conducted a basic walking survey of the project area to locate terrestrial features and record their positions with GPS, photography, and field notes. Targeted features were then documented using measured drawings, video, photographs, GPS, and in many cases, 3D scanning. To assist MHM in the interpretation of features identified during archaeological reconnaissance, it is useful to review the maritime history and archaeology of the area prior to data analysis. This background context will consider archaeological sites recognized on Upper and Lower Lake Minnetonka from earlier time periods.



Lake Minnetonka (Lake Minnetonka Conservation District)

A Brief History of Lake Minnetonka

PRE-CONTACT PERIOD (BC 9500-AD 1650)

Minnesota's Paleoindian Tradition (BC 9500-6000) is characterized by the presence of Clovis and Folsom projectile points and is not presently represented archaeologically on Lake Minnetonka. However, the potential for discovering Paleoindian watercraft such as dugout canoes created using bifacially worked choppers and scrapers from this time period is possible owing to lower lake levels as the area was drying out with the warmer post-glaciation climate. A canoe might have been abandoned on a lakeshore that is now buried and submerged in deeper water. The Archaic Period (BC 6000-800) is typified by a change in stone tool production, including those types used for working wood, as well as the development of copper tool fabrication (Johnson 1988, 6, 10) and the Late Archaic Period is represented on Lake Minnetonka in a terrestrial context (Nienow 2004, 40). The Woodland Period (BC 800-AD 1650) is distinguished by the first pottery production, the construction of earthen mound-type graves, and the development of horticulture (Arzigian and Stevenson 2003, 79). The Lake Minnetonka area was occupied by seasonally sedentary groups of Native Americans throughout the Woodland Period. A group of terrestrial archaeological habitation sites on Lake Minnetonka dating to the Middle to Late Woodland Periods are located on the Halsted Bay Peninsula on the Upper Lake's southwestern shore. A series of archaeological investigations from 1991 to 2014 indicates that this area was occupied from the Middle to Late Woodland Periods. At these sites (21-HE-209-21-HE-213), Lake Minnetonka was exploited for food collection and the near-by thick forests were used for hunting. Specimens of squash, corn, and wild rice have been identified, as well as fish, turtle, bird, muskrat, beaver, and deer. Radiocarbon dating of maize and charred wood samples and ceramic studies indicate probable occupation dates of BC 200-AD 1100, with one sample dating to the Late Archaic to Early Woodland Period (BC 980-830) deemed unreliable (Terrell 2015, III, X, 5, 23, 42, 187-192, 202-203).

On Grays Bay in the Lower Lake, a seasonal occupation site has been documented (21-HE-353) that contained evidence of wild rice harvesting and the production of stone tools. The site appeared to be repeatedly inhabited throughout the Middle to Late Woodland Periods between BC 200 and AD 1400, and possibly into the Proto-Historic Period between AD 1400-1700 (Kloss 2005; Terrell 2015, 45). Another small Woodlands Period habitation site (21-HE-94) documented on Big Island in Lower Lake Minnetonka was comprised of a midden associated with Mound Group No. 6 (Arzigian and Stevenson 2003, 401; University of Minnesota 1992).

Mound burials are the predominate Woodland Period terrestrial archaeological sites located at Lake Minnetonka. Discovered singly and in small and large groups, Woodland burial mounds are found along all of Upper and Lower Lake Minnetonka's shoreline. Mounds exist on Gale and Big Island (as mentioned above) in the Lower Lake and Phelps and Wawatasso Islands in the Upper Lake. Phelps Island is significantly closer to the lake's shoreline than the others and may have been accessible during the Woodland Period without a watercraft, particularly during low water drought conditions. However, Wawatasso, Gale, and Big Islands would only been accessible by crossing the lake on winter ice or by canoe. With these sites recognized, along with the abundance of timber that was available around the lake, and one Woodland dugout

canoe so far identified, it is evident that type was used on the lake throughout the Woodland Period.

CONTACT PERIOD (AD 1650-1837)

Minnesota's early Contact Period is characterized by the movement of the Oto and Ioway peoples from the south into southern Minnesota and the migration of Great Lakes regions tribes into northern Minnesota. During the winter of 1659-1660, a French group moved into the region to exploit the abundant fur trade economy and to explore. These Europeans traded for pipes, corn, and rice with Minnesota's Dakota people in northwestern Wisconsin. In 1660 the French moved into Minnesota with the Dakota for a bison hunt, probably on the west central Minnesota prairie. Other French expeditions in the late 1670s and early 1680s came into Minnesota from the north and south, making observations about the Mississippi River and Lake Mille Lacs. The early Contact Period was also known for conflicts between the Iroquis people and their competitors, fighting for dominance in Minnesota's fur trade (Anfinson 1987, 16-18; Gibbon 2003, 48-49).

Native American Contexts

In search of metal deposits and to conduct trade, a group led by Pierre Charles Le Sueur traveled up the Mississipppi River and Minnesota River to the Blue Earth River in 1700 and encountered the Dakota (Wedel 1981, 2-3). Regardless of this early Contact Period interaction with Europeans to the north and southwest of Lake Minnetonka, the lake itself remained unknown to non-Native Americans.

Euro-American Contexts

In May 1822, 17 year-olds Will Snelling and soldier Joe Brown, along with two other soldiers, "explored the rivulet that supplies the cascade of Minne-HaHa, as far as Lake Minne Tonka" (Neill 1858, 331; Upham 1920, 67, 224, 230). This small expedition was comprised of the first non-indigenous people to see the lake. A contemporary report of this trek is vague, but Minnehaha Creek and Lake Minnetonka are briefly described:

> The country about the fort [Snelling] contains several other waterfalls....One of them, which is but two miles and a half from the garrison...is very interesting. It is known by the name of Brown's Fall...The stream that exhibits this cascade [Minnehaha Falls] falls into the Mississippi about two miles above the fort; it issues from a lake situated a few miles above, A body of water, which is not represented upon any map that we know of, has been discovered in this vicinity within a few years, and has received the name of Lake Calhoun, in honour of the Secretary at War. Its dimensions are small. Another lake of a much larger size is said to have been discovered about thirty or forty miles to the north-west of the fort. Its size, which is variously stated, is by some supposed to be equal to that of Lake Champlain, which, however, from the nature of the country, and the knowledge which we have of the course of the rivers, appears scarcely possible (Keating 1825, 314-315).

Lake Minnetonka is not as large as Lake Champlain, but Keating too readily dismissed the possibility of a large lake existing in the area to the northwest of Fort Snelling. Beyond this visit, Lake Minnetonka remained unknown to European Americans, even after Jean Nicollet combined the data he collected between 1836-1840 during five expeditions to survey the region. His explorations went to the headwaters of the Mississippi River, along the St. Louis River to Lake Superior, down the St. Croix River and then Minnesota River to Pipestone, and into South and North Dakota (Neill 1858, 417-420). Nicollet's map records Minnehaha Creek, marked as Brown's Creek, to where Lakes Harriet, Bde Maka Ska, and Lake of the Isles drain into it; like Keating, Nicollet dismissed the 'rumor' of a large body of water to the northwest of Fort Snelling.

POST-CONTACT PERIOD (AD 1837-1945)

In relation to European activities, the 1851 Treaties of Traverse des Sioux and Mendota opened the Lake Minnetonka area to non-native settlement. Minnetonka Mills was established in 1852 at the source of Minnehaha Creek, at the northeast corner of Lake Minnetonka, now known as Grays Bay. In April 1852, Lower Lake Minnetonka was explored and described by Simon Stevens and Calvin A. Tuttle. These men:

> set out...to search for a large body of water west of the village; they had learned from Philander Prescott, the Indian interpreter at Fort Snelling, that the Indians told of a 'big water', towards the setting sun, in the big woods...Stevens and Tuttle supposed the lake they were in search of to be distant two or three days journey. A little before noon, of the first day, they came to a clear, swift-running stream, which they surmised was the outlet of the lake there were seeking. Following the course of the stream, on its north bank, about one o'clock in the afternoon, they reached the bay, now called Gray's Lake where they cooked and ate dinner. After dinner, still uncertain whether they had found the 'big water', they pushed on, westerly, and came to Wayzata Bay, thence across the ice which was about three feet thick past Breezy Point, to Big Island, where they camped for the night (Atwater and Stevens 1895, 1448-1450).

Upon returning from Lake Minnetonka, Tuttle and Stevens referred to it as "Peninsula Lake". It was accurately claimed that "almost the entire shore appears to be a succession of bays and peninsulas" (Upham 1920, 224).

A few weeks later, in May 1852, Minnesota's territorial Governor Alexander Ramsey toured the Lake Minnetonka area and was credited with naming it using the Dakota words that meant “big" and "water” – Minne and Tonka. The Office of the Surveyor General documented Lake Minnetonka in October 1853 and November 1854. The Minnetonka Mills sawmill on Minnehaha Creek and the Lower Lake's south shore town of Excelsior were established in 1853. Wayzata, on the north shore of the Lower Lake, was founded in 1854 (Dunwiddie 1975, 172; U.S. Surveyor General's Office 1854; Upham 1920, 221, 224, 227).

A visitor in mid-July 1855 described Lake Minnetonka:

> Tuesday morning 10th I took stage for Minnetonka Mills (12 miles S.W. from Minneapolis), on the outlet of Lake Minnetonka. On the way passed a number of beautiful little lakes in Prairie & Timber. At Minnetonka Mill found a first rate Sail boat, and took passage 2 miles up the outlet to the large lake, and thus up the Lake stopping at Wayzata to Excelsior 12 or 15 miles. I believe it is the most beautiful sheet of water I was ever on; the water is clear as crystal, pure as the purest spring, full of fish too. It is beautiful with coves & points mixed up with Islands everywhere. In fact in this region the land is about half water, & the water about half land. Unlike the Lakes in Maine, the land here all around these lakes is very fertile, mostly well wooded, very little rocks anywhere. You can see but a few miles of water anywhere, but the lake is at least 30 or 40 miles long (probably has never been fully explored), and connected on all hands with other lakes. Minnetonka will sometime be a great place of resort, with fine Steamboats & Hotels. Excelsior on South Shore of Lake where I stopped was settled last year by a New York Colony, town laid out & c. Bid fair to be a fine place, good society, families of education & refinement. Both Pianos and Bloomer dresses are plenty and both look well away there in the woods. Yesterday 11th, After a fine swim in the Lake, I started back for St. Paul 33 miles in a Lumber Wagon (Metcalf 1855).

A woman claiming to be the first European-American child born in Hennepin County, on Upper Lake Minnetonka in September 1855, wrote:

> Father took up a piece of land built him a log house and moved in. and there on the banks of the North Arm of Lake Minnetonka in a little log hut on a one leged [sic] bedstead on Sept 11th 1855 I was born. Mother had no Dr only a Midwife or any white Neighbors only as they took a boat and went across the Lake. there we lived for nearly 2 years, Among the Indians. They were very kind hearted, generous, always honorable...My Parents treated them with much respect always dividing with them when they came. they had their trail between the house and Lake and could be seen

> quite often in the Canoes on the Lake. there Mother sat with her new born Babe and watched Father chop and clear a small piece of land" (Brown 1926, 2-3).

Brown must have received this information from her parents due to her age, but the simple mention of a Post-Contact Native American canoe traveling on North Arm is valuable to place Lake Minnetonka's watercraft in context - vessels required to reach Big Island.

The release of the US government's comprehensive 1853-1854 land survey in 1856 focused interest on the settlement of Lake Minnetonka by European Americans. Access to this survey, its information, and its maps provided accurate geographic information about Upper and Lower Lake Minnetonka for the first time. Newspapers began reporting on Lake Minnetonka commercial and agricultural activities and opportunities, providing insight into early Post-Contact geographic details that have changed or no longer exist. For example, "Cottage Island" was described in 1856 as being formerly called Meeker's Island, a change that occurred very early in Lake Minnetonka's Post-Contact history, and now known as Big Island. It was reported that the name change to Cottage Island came about due to the Native American cottages that occupied it. These structures were described: "There are upon it numerous Indian cottages- not the common tepees made of poles and covered with skins and canvas, but houses built of timber, and in addition a large fort made of logs, enclosing nearly an acre, a relic of some contest between the Dacotah and Ojibwa tribes, doubtless". This early newspaper account, in referring to Hennepin County, claimed "no other county offers greater inducements to the farmer, the mechanics, or the tradesman. Builders, cabinet-makers, carriage, wagon and plow makers, are in great demand, and excellent workmen need have no hesitation in emigrating to Hennepin county, Minnesota Territory" (*Northwestern Democrat* 1856). To date no Post-Contact or Contact Period Native American lodges have been located on Big Island, but evidence of them may still be found.

Known Archaeological Sites: Big Island and Its Environs

As briefly mentioned above, archaeological evidence of aboriginal groups and Native Americans has been identified on Big Island - as well as Mahpiyata Island. The known site on Big Island consists of an earthen work identified as a burial mound (21-HE-94) located in Big Island Regional Park. The Mahpiyata sites (21-HE-30, 21-HE-458-21-HE-462, 21-HE-ad) include burial mounds, and lithic and ceramic scatters defined as habitation sites (Office of the State Archaeologist Site Files). These recognized archaeological sites on and near Big Island are not in the subject area dealt with during the 2019-BI Project; therefore, MHM did not have to take them into account during the fieldwork.

Historic Ownership of Big Island

Historic Period ownership and use of the section of Big Island under study during the 2019-BI Project changed over the decades since the original platting of the land in the early 1850s; these changes can be tracked graphically through maps and atlases. The first claim of the island by a man of European descent was Bradley Meeker; his claim was noted on the original plat map for Township No. 117 N, Range No. 23 W, Sections

14 and 22 (U.S. Surveyor General's Office 1854). The land then became known as Morse's Island, with its title going to the Morse Brothers, William and John. John sold his portion of the land, but William constructed buildings and hosted campers and groups of merry-makers during the summer until 1892. Lost to foreclosure, Morse's section of the island that lies in the project area was bought by Samuel Morse - no relation - in 1893. Samuel Morse listed for sale, 60 acres of the island that included the project area, beginning in 1901. In 1905, the Twin City Rapid Transit Company (TCRT) purchased the land to construct Big Island [Amusement] Park (BIAP); the park closed in 1911. The Lake Minnetonka Game Refuge, a conservation effort to breed game birds for later release to augment sagging populations, occupied the project area from 1915-1919. During this time and particularly in 1918, many of the BIAP buildings were demolished and much of the metal that reinforced the concrete used in their construction was salvaged for recycling. In July 1921, the Big Island Veterans Camp (BIVC) was established as a quiet place for World War I veterans, along with their families, to spend two weeks of recreation each summer. The BIVC closed in 2003, and 51.56 acres of the northeast area - in two sections of Big Island was purchased by the City of Orono in early 2006 (Hennepin County Property Records; Maravelas Forthcoming, Chapters 5, 10, 11, 14).

An 1879 map of Big Island noting W. B. Morse's ownership of the project area (Cooley 1879).

Big Island [Amusement] Park

The BIAP was primarily constructed during 1905-1906 - and into 1907 for certain buildings - by the TCRT. The development of the park was a huge endeavor, one dependent on the construction of an incredible amount of infrastructure that was only possible after the transportation of immense quantities of building materials to the island. Firstly, dredging of Big Island Bay for steamboat traffic and the strengthening of the shoreline was necessary to insure regular and safe delivery of raw materials and and any earth moving machines. Once equipped, the TCRT workers constructed serious infrastructure that included the steamboat pier, placed electrical lines, conduits, sewers, and a deep well. The TCRT workers then took to grooming walkways - some with concrete, constructing decorative archways, a pergola, park benches, and two small docks. After the completion of infrastructure installation, the TCRT constructed several buildings, large and small, throughout the 50+ acres of rolling island. The

Mission Revival buildings consisted of a water tower, commissary/restaurant, women's and men's dormitories, at least three multi-stalled toilet structures, a large music casino, band stand, a pump house, ice house, ice cream factory, boat house, and two picnic kitchens. The amusements constructed for visitors included a roller coaster, water ride, a 'fun factory', a carousel, picture gallery, kinetoscope, and a hooligan slide, along with 48 Johnson rowboats for use in the bay. TCRT's workmen rushed to complete enough of Big Island Park's amusements and infrastructure in time for the grand opening on 6 August 1906. In reality the park was not finished until the following year. However, "Innes and his famous New York band" served as the main entertainment at the music hall and were well received, playing at the island for over a week. The Park was open between 1906 and 1911, with the music hall hosting several entertainments for visitors. Ultimately, the Park was unprofitable, and it closed in late August 1911 and it was mostly dismantled during 1918 (*Minnetonka Record* 1906a, 1906b, 1906c; Olson 1976, 202-203, 205; Construction Records: Ledgers, TCRT Records 1906-1908, 509, 513, 515-517, 519).

Big Island Veteran's Camp

The BIVC opened for use by World War I veterans and their families on 18 July 1921. In cooperation with the District 10 Federal Board for Vocational Education, the Minnesota Legion Headquarters organized the camp's development with funding from the Minneapolis War Chest Fund; existing buildings were repaired and new constructions were completed. Additional camp maintenance funding was raised through such activities as boxing matches sponsored by Elks Clubs, and certain sporting equipment was supplied by Fort Snelling authorized through the War Department in Washington, DC. For $15.00 and reduced railroad fares, veterans could spend two weeks using the camp and its accommodations, including regular transportation to the Lake Minnetonka's 'mainland'. The camp was promoted as the "Disabled Veterans Summer Camp on Big Island, Minnetonka" in some publications. Regionally, disabled service men from Minnesota, South Dakota, North Dakota, and Montana were offered placement at the BIVC. The guest veterans - also called 'buddies' - would have a camp director on site to manage daily operations, two recreational supervisors in charge of activities, and a fully-staffed mess hall. Amenities offered included "sports of all kinds, plenty of fishing, boating and bathing" that would be overseen by an athletic instructor. The camp's promoters were claiming the island's "accommodations will be ample and up-to-date [and] every effort has been made to provide facilities to give every disabled solider the time of his life at Big Island" (*Daily Ardmoreite* 1921; *Glasgow Courier* 1921; *Great Falls Tribune* 1921; *Little Falls Herald* 1921; *Log Cabin Democrat* 1921; *New Ulm Review* 1921).

For the next several decades, the BIVC provided a place of recreation and vacation for veterans and their families. In 1965, Beatrice and Emil Berg celebrated their 40-year tenure as the camp's managers. During the summers, the Bergs were assisted by cooks Kay Olson and Teckla Bjornson, and storekeeper George Mexas. The Bergs spoke about the demolition of the BIAP and the recycling of copper and other metals from the abandoned buildings, and the burning of the first BIVP mess hall in 1924, a year prior to their arrival. Also described was the 400-foot deep well dug for the BIAP and still used

by the BIVC, and the fact that the camp was opened to all veterans; disabled buddies received priority and reduced rates. In the 1960s, the camp offered veterans transportation from Excelsior to the BIVP four times daily. While there, fishing boats and horseshoes were available for use, and Mexas's recreational building offered movies, TV, dancing, and an array of snacks. Also in 1965, the Bergs spoke of the surviving Mission Revival Archways associated with two BIAP buildings and 'metal scrap' from the Music Casino (Grim 1965).

Above: Beatrice and Emil Berg. Right: Veteran's families in front of Cabin E on Point Charming (Braley1965a-b).

Archaeological Assessments of BIAP and BIVC: 2003 and 2007[1]

In 2003 - with the permission of the BIVC managers - MHM and volunteers Anne and Liz Kramer conducted a brief examination - two test trenches - of a wall near the BIAP Roller Coaster area, located and detailed the contours of the Mystic Chute (labeled as 'The Old Mill' on the 1912 Sanborn Map), the foundations of a toilet facility, and completed a walking survey of the BIVC area. At that time, a few stone and concrete foundations of BIAP buildings, amusements, and infrastructure such as sewers were evident. Small artifacts were also recorded, including various types of ceramics that date to the BIVC. Since 2003, all but one of the BIVC buildings have been demolished; the remaining structure was used as the camp's office in

A test trench next to a terra cotta brick and concrete wall near the Figure Eight Roller Coaster, dug in 2003 (MHM).

[1]This section of the report is drawn from MHM's *2007 Big Island Summer Institute: Dig on This Archaeology Program Report*, Ann Merriman and Christopher Olson, Maritime Heritage Minnesota, 2007.

its latter years and can be seen near the island landing.

In 2007, at the invitation of Orono Community Education's Big Island Summer Institute (BISI), MHM - without compensation - conducted a children's archaeology program on the island. Before the BISI program began, MHM revisited the Roller Coaster and Mystic Chute Ride, and also briefly examined the Women's Dormitory, a picnic kitchen, the remains near the Pond, and the Dance Pavilion area. MHM took note of the absence of the original concrete stairs from the BIAP Water Tower that had survived as an archaeological feature and were extant in 2003. This feature was also used as the entrance stairs to the BIVC Mess Hall prior to its razing in 2006. In addition, MHM studied artifacts located in the vicinity of the Mess Hall, photographed two BIVC garage buildings for historic preservation purposes, located the rubble of a destroyed cabin - the BIVC Cook's Cabin - and recorded a section of the Steamboat Pier remains.

At the beginning of the BISI and out-fitted with copies of the 1912 Sanborn Map of Big Island in hand, MHM, volunteer Kelly Nehowig, the BISI staff, and the program's kids[2] completed a walking survey of the BIAP and BIVC *in situ* archaeological features and artifacts. The primary goal of this brief inspection of the project area taught the kids how to locate - but not disturb - artifacts, recognize large concrete and earthen features (building foundations, unidentified concrete remains, the Mystic Chute Ride contours), discover hidden architecture among the foliage, and critically think about what locations around the island would produce artifacts and features that could help us interpret the activities of its previous inhabitants. Firstly, MHM directed the kids' attention to various bits of concrete along the walking path leading from the modern picnic pavilion and the current boat landing, surmising what BIAP ruins may lie beneath. As expected, the group's attention was drawn to several red flags placed by MHM the previous week. The flags marked the probable locations of Mission Revival Archways that were constructed around the island and their remains were likely close to the ground surface. Then, MHM showed the kids how to line up in an east-west orientation at the bottom of the hill below the site of the former BIVC Mess Hall. This operation was set up so the kids could walk transects up the hill, making observations of artifacts and features as they progressed. As expected, the group became very excited at the quantities and varieties of artifacts upon the hill on the location of the demolished building. Occasionally, a child picked up an artifact, and once again MHM stressed the importance of leaving artifacts *in situ* until they are thoroughly documented, drawn, photographed, and properly tagged. After a brief reconnaissance of the Mess Hall site, MHM directed the group eastward toward BIVC buildings, as well as the site of the recently demolished Cook's Cabin, also evident by the presence of artifacts.

To the southwest of the four BIVC cabins located near the island's northern shoreline, a large piece of metal mowing equipment, evidence of melted rubber, tar paper, and building materials, and the remains of a wooden building were located. A small midden containing complete Homer Laughlin white ceramic plates and other artifacts were also

[2]The BISI staff and kid participants: Jake Westman, Kiira Siitern, Marleane Callaghan, Christian (Buddy) Belz, Erik Belz, Isabel Brandt, Dylan Breon, Ellen Conger, Emilyjohn Connors, Kalvin Danielson, Missy De Pietro, Zach De Pietro, Megan Donaldson, Ivan Grafft, Allison Mullin, Sienna Penner, Willie Rohweder, Ozzie Secundino, Eva Shuman, Alana Sundby, Ian Sundby, Tommy Swenson, and Jake Zell. MHM's good friend, the late Jim Ogland, also spent a day with us on the island.

discovered. Sewer infrastructure with streetcar rails spanning them and dating to the BIAP, were located in the midden area and also near the Women's Dormitory. A similar sewer cover was located behind the modern bathroom facilities to the southwest of the Mess Hall site. Just south of the BIVC buildings, MHM led the group into the woods. Immediately the kids recognized the Mission Revival construction of the BIAP walls and referring to their maps, determined that we located the site of the Roller Coaster. They quickly investigated the Roller Coaster enclosure wall and a nearby plinth, and MHM pointed out a large reinforced concrete base for a Roller Coaster support. The group then moved to the location of the Mystic Chute Ride, just west of the Roller Coaster evidence. The kids admirably identified the large in-ground feature that comprises the Mystic Chute Ride remains. MHM posed questions to them, encouraging them to think of other rides they may know of that resemble this one: the 1913 "Ye Olde Mill" at the Minnesota State Fair grounds and flume rides among them. Further, we made the kids aware of the surrounding tree growth, drawing their attention to the placement of older trees, of a different species than the majority of others, around them. The kids correctly surmised that these trees were probably planted in 1905 during the construction of the BIAP, or that the Park was constructed around them. Further, their specific placement could be used as an indicator where the inside walls of the Mystic Chute Ride contours could be traced, since the trees lie within the confines of the ride itself. The brief survey concluded with an investigation of some BIVC features northeast of the Roller Coaster site.

Returning to the area of the boat landing on Big Island Bay, using trowels and brushes, the kids began to investigate the suspected locations of the Mission Revival Archway Bases previously marked by orange pin flags. Four Archway Bases were partially uncovered to the west and three to the east of the still extant small Gazebo foundations bordering the existing BIAP entrance steps. The kids were encouraged to make notes in their survey notebooks, and to draw and measure the emerging archaeological features. Already partially uncovered, another was located to the west and two more to the east, making a total of 10 Archway Bases (Features ABW 1-5, ABE 1-5). It was discussed with the kids how we could determine where more bases were and they caught on quickly by deciding it would be good to measure the distance between them, and extrapolate from there where the next bases would be placed. The various levels of preservation of the 10 Archway Bases uniquely demonstrates their architectural terra cotta brick (hollow, reinforced with concrete inside)[3] construction. The Archways were built-up on a poured concrete base, held together with mortar, and a concrete core was created when the concrete was poured into the vertical channel created by the terra cotta brick. In essence, the architectural terra cotta bricks were used as a form to create the concrete core. The Archways were then smoothed on the outside with stucco, created from a cement base. Also, 1 Archway Base had a much bigger bottom platform than the others, and the kids hypothesized about why that might be. A good idea put forth was that this Archway may have had a set of stairs nearby and it was part of that, that the Archway that formerly occupied the site had to support extra weight, or that it

[3]The amount of concrete used as a reinforcement material inside the architectural terra cotta brick throughout the BIAP constructions varied, depending on the person building the features. In consideration of the bricks that are available for study around the site, most often the bricks were less than 50% filled, and some bricks do not have any concrete inside them. The Archways were not load-supporting constructions, so this variation was not significant and did not determine the ultimate strength of the feature.

was confluence of 2 different Archways meeting each other. Of particular interest during the uncovering of the east bases was the collection of 2 bullet shell casings that were documented *in situ* and treated as small finds. The boys excavating this trench hypothesized several scenarios as to why these casings were present, from the intrepid hunter hiding in the foliage to a possible murder scene. Since they also found a small animal bone, they felt the hunting scenario was more likely.

Kids excavating Archway Bases during the Dig On This fieldwork in 2007 (Kelly Nehowig).

Next, MHM asked the kids to deduce where the 'best' location to set up trenches in order to discover artifacts that could help us understand the activities of the people present on the island in the past. One junior surveyor suggested the Mystic Chute Ride, which does seem like an obvious choice. However, we posed questions to him about the logistics of such a dig, not the least of which would be the probable clearance of some small trees around the area. The kids agreed that, at this moment, a better place to dig would be the site of the former BIVC Mess Hall, where artifacts were exposed on the ground. MHM staff set up ten 36 by 36-inch test trenches in a North-South orientation with iron spikes and string, leveling off the north side of the trench string to be used for triangulation. Then, a small investigation of the former Mess Hall location began with a short lecture on the basic excavation techniques of trowel use, triangulation, and the written recored. The kids recorded the surface finds of their trench, drew and measured the placement of visible artifacts while *in situ*. All excavated artifacts were then organized into their different artifact types once they were removed from their contexts.

A test trench on the location of the burned BIVC Mess Hall (MHM).

After the BISI program ended, MHM returned to Big Island to re-evaluate the data produced by the kids for accuracy. MHM staff cleaned and created measured drawings of the 10 exposed Archway Bases near the shoreline. After their complete documentation, MHM staff placed plastic orange emergency tape - marked with “MHM

OLSON MERRIMAN 6-27-2007" - over each Archway Base and backfilled the test trenches. The tape delineates the archaeological feature still *in situ*, the disturbed soil above it, and the undisturbed soil below and adjacent to it. MHM investigated the boat landing underwater to locate the remains of the BIAP Steamboat Pier, a large earth-filled 'W' shaped structure with dozens of support pilings. Within minutes of entering the water, 1 piling was located and marked with a flag, with an additional 13 pilings identified - in less than 10 feet of water - as work continued. In places, horizontal wood planks survived between the pilings; these planks are easily discerned in historic images of the Steamboat Pier.

Conclusions: 2003 and 2007 Archaeological Assessments

It was determined that the BIVC bathroom, approximately 470 feet to the southeast of the former Mess Hall location, was constructed on a BIAP bathroom foundation. The foundation is currently a raised concrete slab with evidence of partitions, toilet drains, and shower stalls. A wooden fish cleaning shack that still stands east of the Mess Hall location, approximately 150 feet northeast of the bathroom foundation also rests on top of a large concrete slab that once supported a BIAP Picnic Kitchen. Disruption of this foundation by tree roots was extensive, and the area was strewn with the remains of architectural terra cotta bricks. MHM examined four BIVC cabins that, at that time, still stood to the northeast of the Mess Hall archaeological feature near the northern shoreline of the island. These buildings were in disrepair, but still contain strong evidence of their former appearance and were determined to be structurally sound after a brief examination. Two BIVC garage buildings, southeast of the Mess Hall site and located next to the remains of a razed BIVC cabin and lying to the north of the BIAP Roller Coaster site, contained interesting construction components. These buildings are built from simple concrete blocks and in one garage we found ceiling insulation that consisted of old bundled newspapers. The most accessible dated to 16 January 1949 and reported on President Truman's inauguration.

Closer examination of the toppled pieces near the Pond indicated these structures were substantial concrete plinths. This area is a conundrum. The profuse amounts of terra cotta brick and concrete found in this area may indicate a dump site for torn-down buildings, but the sizeable plinths and the position of one in situ suggests they, at least, are original to this site. Further, a very large and recently (around 2005) uprooted tree had grown under a large piece of concrete, up-ending it and breaking it into pieces when it fell. MHM re-traced the enclosure wall east of the Roller Coaster Ride and located two pontoon floats and kitchen equipment dumped in the area from a cruise boat or possibly from the old BIVC, probably dating to the 1980s. Moving west, MHM traced the Mystic Chute Ride archaeological feature, wrapping orange tape around small trees to trace its perimeter in the woods. MHM was gratified to locate remains of the Steamboat Pier extant in Big Island Bay; this underwater portion of the site requires further examination.

The brief terrestrial and underwater archaeological survey and test excavations conducted by MHM in 2003 and 2007 on Big Island represent the groundwork for a thorough Cultural Resources Management assessment. The potential for the location and investigation of archaeological features on Big Island will only be fulfilled with further historical and field research - a needed exercise to ensure that the cultural

heritage of this Lake Minnetonka resource is preserved for future generations and understood by our own. During MHM's side and down-imaging sonar survey project of Lake Minnetonka in 2011, MHM completed a Minnesota Archaeological Site Form for the Big Island Steamboat Pier, Park, and Veterans Camp Site and acquired its number - 21-HE-402 - at that time (Merriman and Olson 2012, 43-47).

2019-BI Project: Research Design and Methodology

As briefly presented above, Big Island on Lake Minnetonka has a long and diverse history from the Prehistoric Period to the present. In regards to archaeological features that survive to represent that history within the project area that can be accessed with a comprehensive Phase I project, no prehistoric or Native American evidence was expected to be identified. With this supposition - and after a review of archaeological fieldwork from 2003 and 2007 - MHM's methodological examination of the site's surface during the 2019-BI Project readily confirmed the existence of historic features and artifacts associated with BIAP and BIVC, but no obvious indigenous activity. Within the limitations of a Phase I research design, MHM surface cleaned - often simply raking the ground and removing leaves - to expose archaeological features. If warranted, further cleaning by the removal of the surface matrix provided increased clarity when identifying features. From there, MHM returned to specific features for further documentation using shovel testing and small test trenches to expose foundation architecture and infrastructure; this strategy provided the evidence required for archaeological assessments of the cultural resources within the project area.

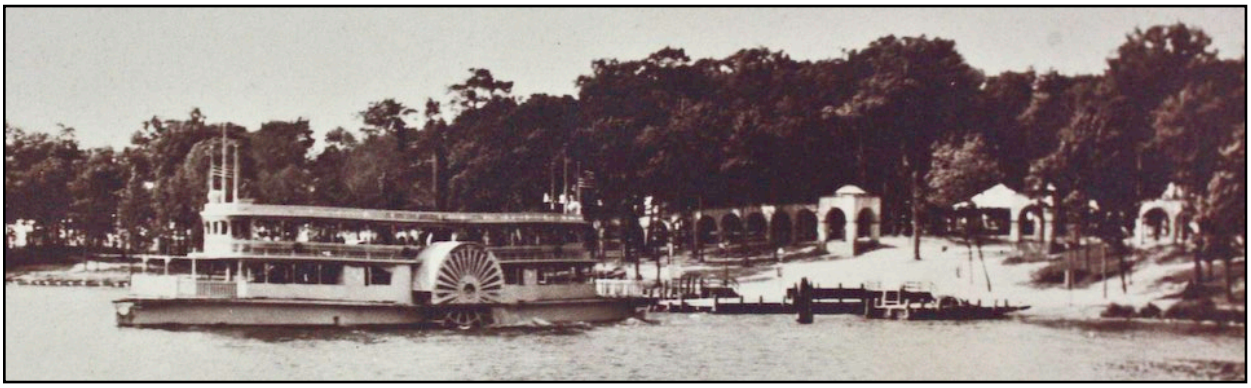
2019-BI Project: Findings

While MHM was satisfied with the results of the investigations in 2003 and 2007, that fieldwork's research designs did not provide for an in-depth examination and identification of BIAP and BIVC features that may be accessible using minimally invasive terrestrial archaeological techniques. However, the Cultural Resource Management (CRM) recommendations that MHM provided after the 2007 season are still valid, but with modifications based on technological advances over the last 12 years. Firstly, MHM can establish datums and determine the three dimensional placement of features and artifacts within the project area if needed, assisted by advancements in hand-held GPS units, portable 3D scanning, and the web tools Google Earth and LiDAR on MnTOPO/OSA. Further, many of the CRM recommendations can only be accomplished within the parameters of either a Phase II or Phase III excavation. Therefore, MHM's primary goals for the 2019-BI Project were to conduct a systematic walking survey to recognize cultural resources, record their positions using GPS, categorize them by type, and document at least one example of each feature type using 3D scanning.

BIAP Steamboat Landing and Stairs

The Steamboat Pier feature is not part of the research area for this project because that section of 21-HE-402 is under the jurisdiction of the Office of the State Archaeologist, not the City of Orono. MHM has assessed the pier feature using side scan sonar and

SCUBA, and this will continue. However, the BIAP Steamboat Landing survives, is mostly intact, and when approaching the project area by boat, is the most obvious component visible. Originally comprised of 6 foot by 6 foot poured concrete slabs, the surviving area measures 57.50' by 114.00' feet at its longest point near the shore. Some of the Landing along the shoreline partially survives because of erosion and rip rapping. The Landing was designed with 1 circular area left unpaved, and a tall tree once grew there; that area is still evident. The Landing Stairs survive - although they have been damaged in recent years - and are 63.50 feet long, 5.80 feet wide, and are comprised of 4 steps. On either side of the stairs, two Gazebo Bases remain *in situ*.

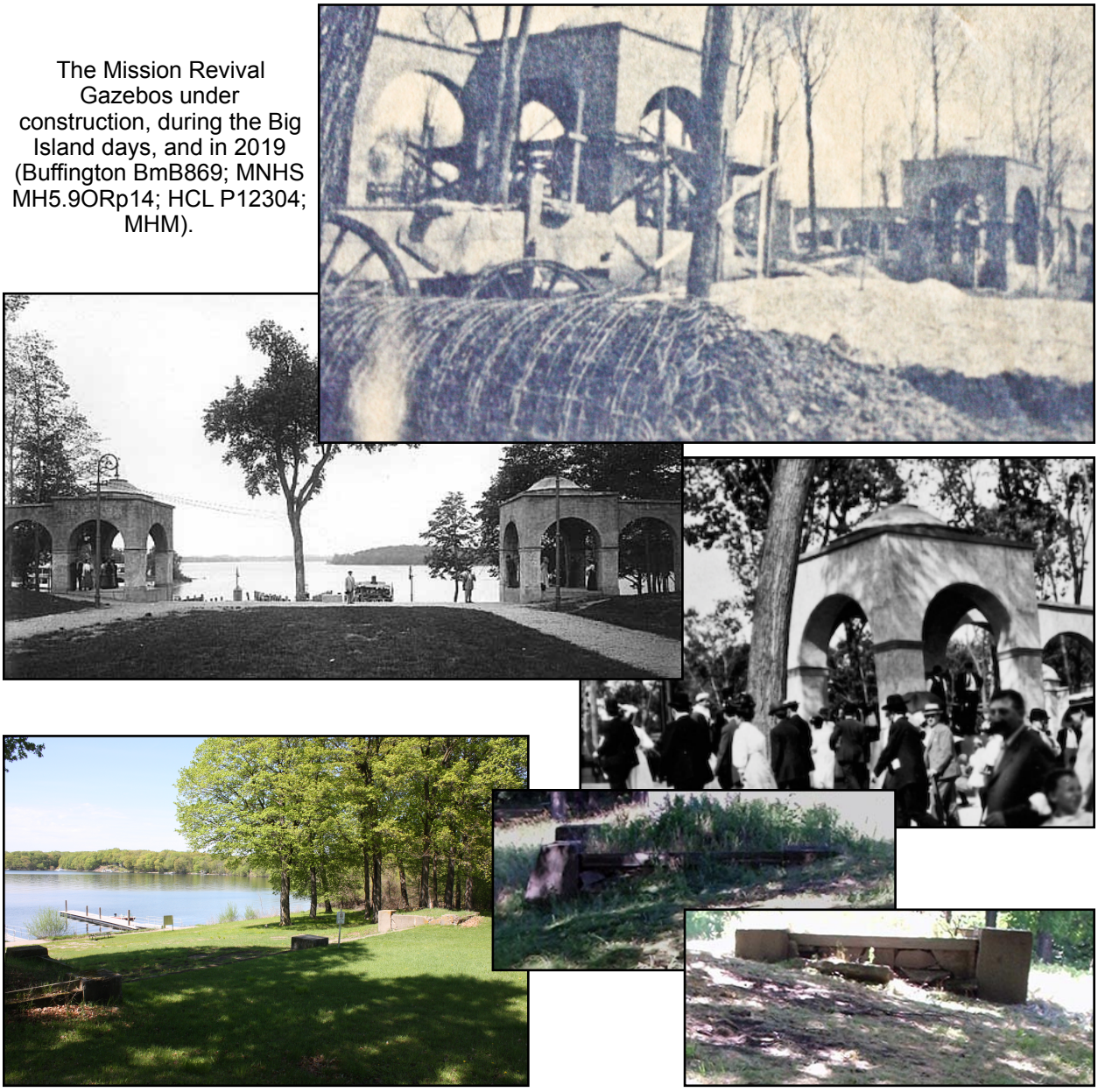


The Landing as seen from Point Charming while the sidewheel ferry *Minnetonka* leaves Big Island (ELMHS 2017.27, donated by Scott McGinnis).

The concrete Landing at the steamboat pier(ELMHS PB12). Insets: The Landing in 2007 and 2019(MHM).

BIAP Mission Revival Gazebo Bases

The east and west Gazebo Bases that lie on either side of the Landing Steps once supported Mission Revival Gazeboes that offered shaded 'waiting rooms' near the Steamboat Landing. The Gazeboes had domed roofs supported by sturdy arches; in 2019 they measured 15.30' square. Heading to the east and west from the Gazeboes, curving Mission Revival decorative archways led BIAP patrons away from the Steamboat Landing; these Archways supplied some shade simply by their existence, but they are not a true arcade, blind arcade[4] or peristyle[5].



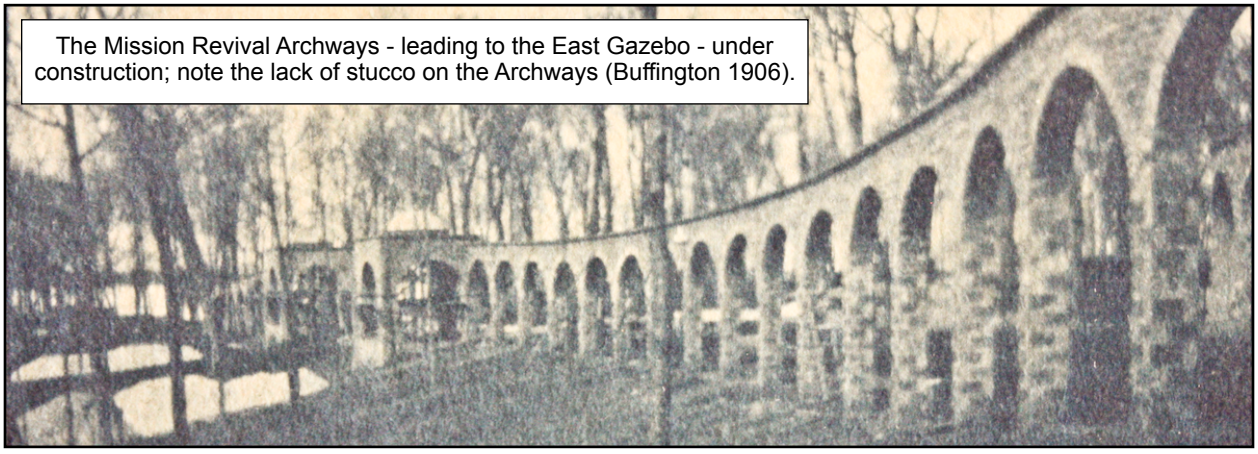
The Mission Revival Gazebos under construction, during the Big Island days, and in 2019 (Buffington BmB869; MNHS MH5.9ORp14; HCL P12304; MHM).

[4]An arcade is a covered walkway whose roof is supported by columns on either side. The BIAP Archways suggest a blind arcade (imitation arches that carry no weight and are simply part of a wall), but the island versions are not found on the sides of buildings as 'fake' arches.

[5]A peristyle is a row of columns that surround a courtyard or are connected to a structure that surrounds an open area, creating shaded walkways.

BIAP Mission Revival Archways

When opened, the BIAP's most conspicuous feature on the ground was its Water Tower. However, actually the more obvious features were the Mission Revival Archways that could be followed and seen throughout the BIAP grounds. The BIAP Mission Revival Archways had 3 functions: 1. They acted as guides for BIAP patrons to navigate to different offerings on the island; 2. The Archways camouflaged the 'working' areas of amusement rides and infrastructure; 3. Some Archways created porticos[6] around certain buildings; and 4. The size of the Archways provided shade for island patrons. As described above during the BISI Program, MHM confirmed the presence of Mission Revival Archway Bases just under the ground surface to the east and west of the Gazebo Bases (Features ABW 1-5 and ABE 1-5). Because of the proliferation of the Archways - and the survival of some examples into the 1960s - they have become the hallmark of the BIAP, even more than the impressive Water Tower. During the 2019-BI Project, MHM did not investigate any previously unknown Archway Bases because the results from the BISI Project answered questions about the internal structure of the features. However, 11 partial Archways survive above the surface west of the BIAP Mall and the Water Tower, north and west of the Mystic Chute, and east of the Figure Eight Roller Coaster (Features A1-A11). MHM recorded the positions of the Archways and 3D scanned 3 examples that could answer the most questions. Feature A1, damaged and partially under a fallen tree, has an *in situ* Base with much terra cotta brick intact above the surface; this feature represents the material that did not survive in association with Features ABW 1-5 and ABE 1-5. MHM created a 3D model of Feature A1. The other partial Archways - Features A2, A3, and A4 - are in varying states of preservation, and A3 and A4 are toppled over. Between Features A1 and A2, a section of broken concrete Pavement was exposed. Also, several Archway Bases without additional terra cotta brick or concrete have survived *in situ* in the form of flat blocks. Located southeast of the Ice House, Feature A5 consists of 5 *in situ* concrete blocks. Feature A6 is located further to the southeast of Feature A5 and it is a singular *in situ* block. Features A5 and A6 have terra cotta and concrete middens associated with them nearby (A5 Middens 1 and 2, A6 Middens 1 and 2). Features A9 and A10 are singular *in situ* blocks northeast of the Water Tower (A10) and amusement rides (A9); Archways A7, A8, and A11 located near the amusement rides survive as 'scars' in their support wall sections, and one Archway that is toppled into a gully.

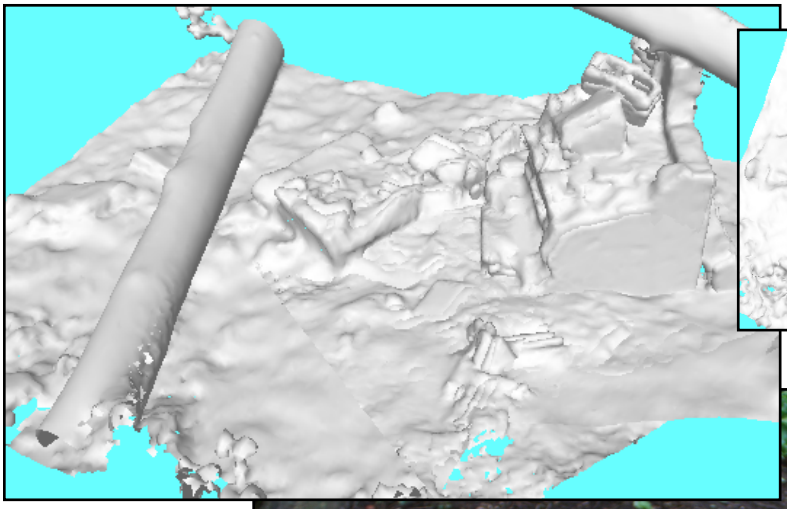


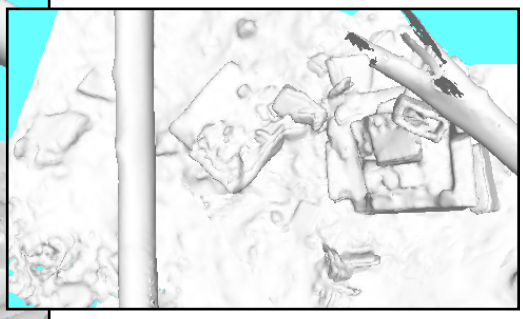
The Mission Revival Archways - leading to the East Gazebo - under construction; note the lack of stucco on the Archways (Buffington 1906).

[6]A portico is a covered walkway supported by archways or pillars attached to the entrance and/or exterior of a building.

Archways leading to the east end of the BIAP (ELMHS SP-BI1).

Archways leading to the west end of the BIAP (Womack 1908, 107).

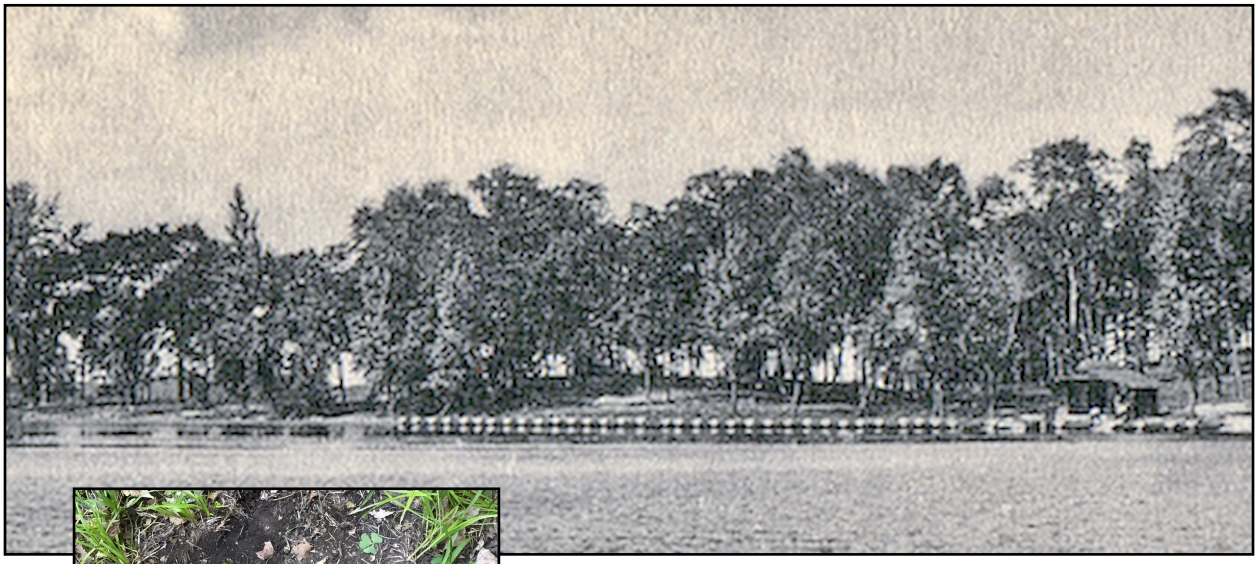




3D scans and an image of Archway 1 (MHM).

BIAP Boat House

The BIAP Boat House is located west of the Steamboat Landing; it is comprised of 1 *in situ* concrete block. In consideration of the Sanborn Map and contemporary images, MHM has concluded this feature is the BIAP Boat House. Records indicate the Boat House was 11.00' by 20.00' in size and it was constructed of wood. The BIAP staff and patrons used the Boat House as a storage unit for oars and other items that were needed to operate and enjoy the dozens of Rowboats owned by the Park (Russ Olson 1976, 203). During the BIVC years, a small wooden shed was constructed on the footprint of the Boat House, and a garage-style boat house with a sliding barn-like door was built next to the shed on the west side.



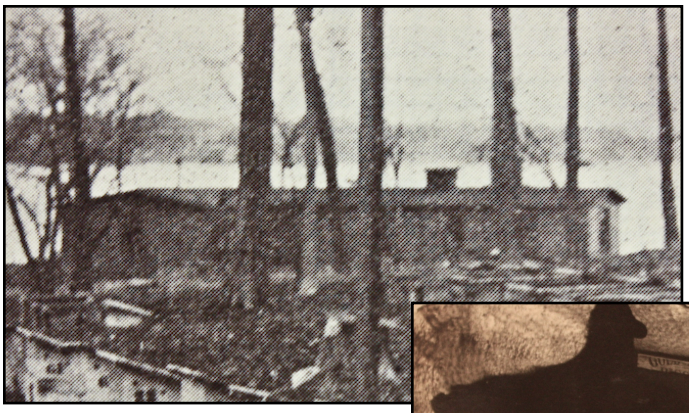
The BIAP Boat House on the shoreline to the west of the Landing; note the fleet of small wooden row boats waiting for patrons (ELMHS).

This *in-situ* concrete block is physical evidence of the BIAP Boat House (MHM).

BIAP Staff Kitchen

The BIAP Staff Kitchen was a large 69.00' by 20.00' wooden building constructed in a L-shape (Olson 1976, 203). Historically, MHM has located 1 and possibly 2 photographs of the building[7] and archaeologically, the structure survives as artifact middens Staff Kitchen Middens 1-4 (SK Midden1-SK Midden4). The Sanborn Map recorded the footprint of a building in the proposed location of the Staff Kitchen, but it does not agree with the reported dimensions of the building or the photograph. However, MHM contends it is highly likely the artifactual and photographic evidence support our supposition for the placement of the feature. (State Game and Fish Commissioner 1916, 34).

[7]The identification of the BIAP Staff Kitchen in the Game Farm photograph was suggested by Paul Maravelas; MHM has concluded that he is correct.



The BIAP Staff Kitchen located on the western side of the project area (State Game and Fish Commissioner 1916, 34).

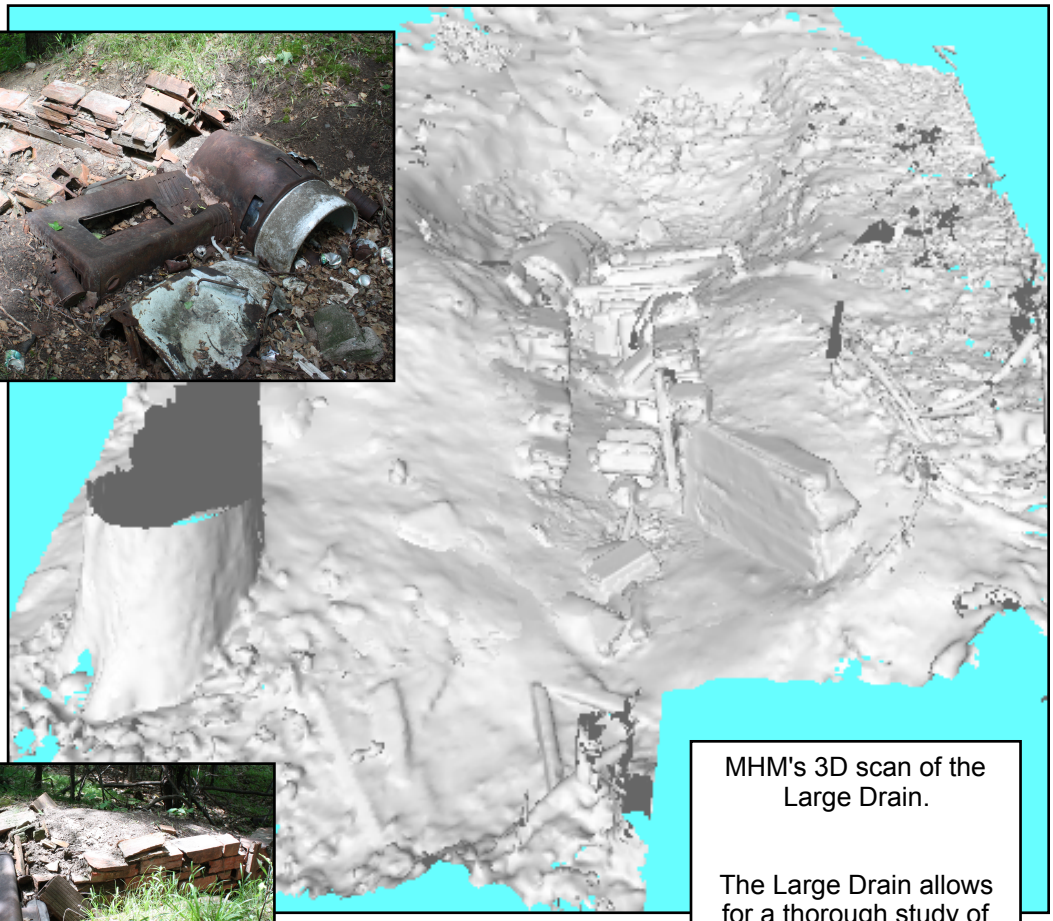
During the Game Farm years, the caretakers of the island re-used BIAP buildings. Based on the position of the Men's Dormitory in the background of this image,'Scout's Shack' was the Staff Kitchen (ELMHS).

Staff Kitchen Middens 1-4, artifact scatters located on the western side of the project area (MHM).

BIAP Infrastructure: Large Drain

The exposed nature of Feature D6 on the western side of the project area is particularly helpful from an archaeological standpoint; studying the construction of this Large Drain assisted MHM in understanding other similar, smaller structures around the project area. Feature D6 is comprised of a rectangular ditch with a channeled outlet on the western end that is formed from 2 walls of architectural terra cotta bricks, concrete, and mortar. The channel walls widen and flare outward to accommodate the water it is meant to drain away from the BIAP structures. The northern wall is damaged where it begins to flare outward; it is slowly being upheaved by a large tree growing nearby and it's roots are pushing the brick wall upward and over. Many pieces of broken concrete slab and terra cotta bricks surround the area; again, moved about by tree roots. On the south end of the channel wall, prior to its widening out, 2.00" by 4.00" pieces of wood were embedded vertically on both the north and south corners. One of these wooden pieces is *in situ* and the other was dislodged and broken in 2 pieces; it is lying slightly downhill from its original position along with loose terra cotta bricks. The rectangular ditch has been used as a landfill over the decades. People have thrown not only pop, coffee, and beer cans and bottles into the hole, but vintage washing machines (2) and a

furnace. One of the washing machines has a control panel that is imprinted with the name 'Sears Lady Kenmore'; it is round, has a wringer, and dates to the 1940s. It is probable that the appliances and furnace were once components of the BIAP Staff Kitchen. MHM does not know if the rectangular portion of Feature D6 is lined with concrete; that question would be answered with a Phase II or Phase III archaeological investigation. MHM 3D scanned and recorded the position of the Large Drain.



MHM's 3D scan of the Large Drain.

The Large Drain allows for a thorough study of the construction techniques and materials for the BIAP buildings (MHM).

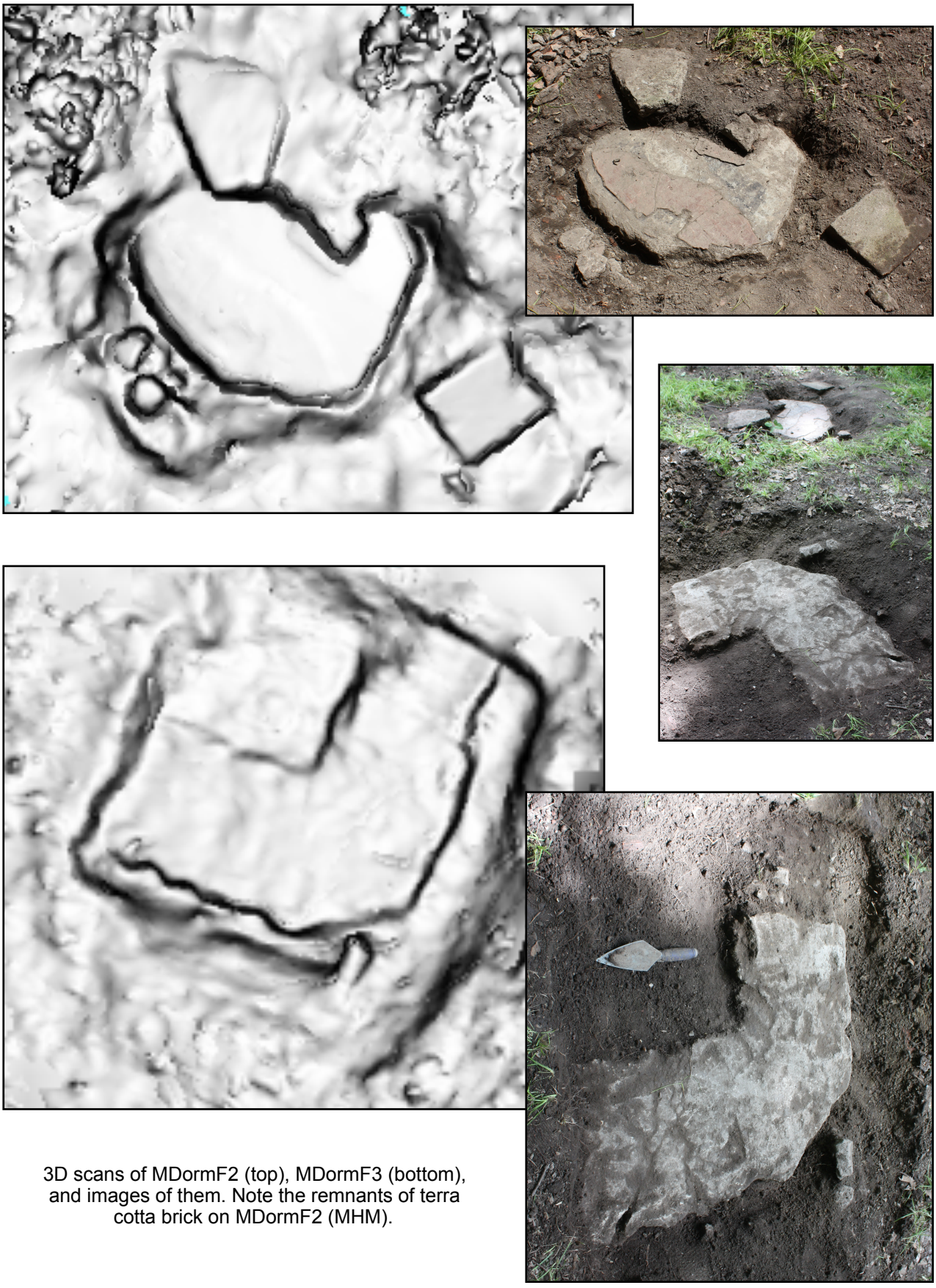
BIAP Men's Dormitory

Located near Features A2, A3, and A4, the Men's Dormitory building, Feature MDorm - Men's Dorm Foundations 1-3 (MDormF1-MDormF3), Men's Dorm Pavement (MDormP), Men's Dorm Middens 1-3 (MDormM1-MDormM3) - housed the male employees of the BIAP. These features represent the *in situ* and midden remains of the Men's Dormitory. The northernmost area of Feature MDormF1 is a foundation block that may mark the location of the front door, a room division, or the end of the building. The building was constructed using architectural terra cotta brick and concrete, had 2 stories, and reportedly measured 85.00' long by 28.00' wide (Olson 1976, 203). After the BIAP closed, the Dorm remained intact and was used by the BIVC as a barracks when the camp opened in 1921. MHM is confident that the majority of the building's foundation and concrete floor are intact under the surface matrix, particularly since the Dorm stood until 1987. Further fieldwork would answer this and other questions.

The Men's Dormitory as seen in the background of an image from the time of the Game Farm (ELMHS).

Left: The front of the Men's Dormitory with bird cages near-by. The arched entrance can be seen through the cage (State Game and Fish Commissioner 1916, 35).

Below: The Men's Dormitory (Drewry, ND).



3D scans of MDormF2 (top), MDormF3 (bottom), and images of them. Note the remnants of terra cotta brick on MDormF2 (MHM).

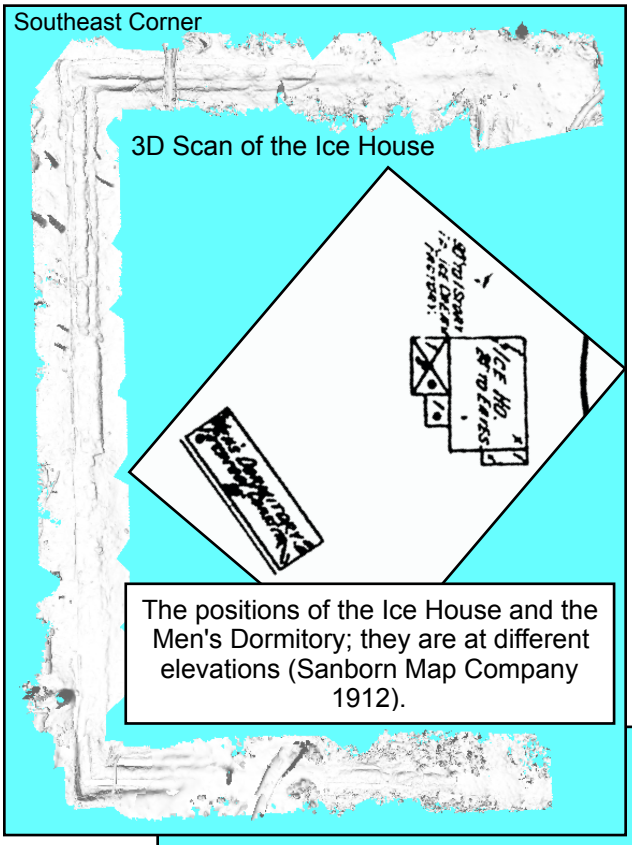
BIVC Building Foundation and Floor

Near the Men's Dormitory, slightly to the southeast, a BIVC Building Foundation and Floor (Feature T4) are extant. As seen in an aerial image from 1971, the foundation was larger at that time, suggesting a big building had been constructed there by the BIVC. In 2007, during the BISI Project, a bathroom building stood on the spot; it was torn down between 2010 and 2012. A 2012 aerial image of Feature T4 clearly indicates the foundation floor had a series of holes for toilets; the other 2/3 of the floor appeared to be compacted earth, but still obvious. This section of the foundation floor is not evident, but a paved sidewalk to the east of that footprint does survive. Photographic images of the BIVC from the 1930s and 1940s would be helpful in answering questions about Feature T4 and by association, the Men's Dormitory (MDorm).

Above: The Bathroom Building as it looked in 2007 (MHM). Right: An image taken soon after the building was torn down (Google Earth). Below: The Building Foundation and Floor in 2019 (MHM).

BIAP Ice House and Ice Cream Factory

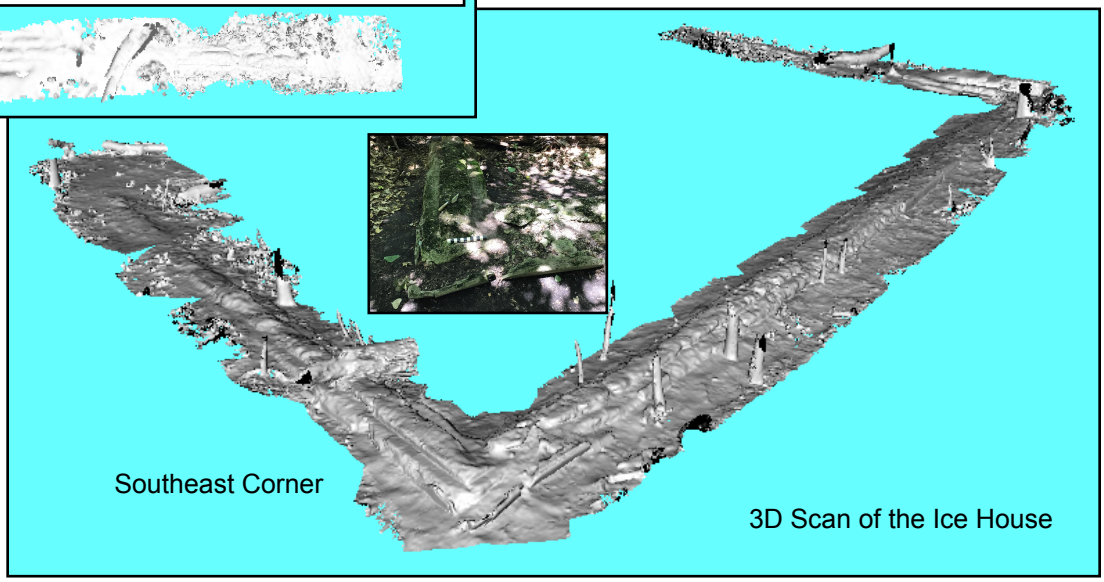
MHM located the intact rectangular foundation of a large building - the Ice House - early on during the 2019 fieldwork. Based on its location, MHM has determined it was the BIAP Ice House that had a small Ice Cream Factory attached to its southwest side (Sanborn Map Company 1912). The Ice House was 50.00' long and 40.00' wide; the Ice Cream Factory appeared to be a smaller rectangular wooden building was approximately 20.00' long by 10.00' wide. The Ice House had a substantial concrete foundation, 1 story, and was constructed of wood. The absence of *in situ* or broken terra cotta bricks in the matrix attests to the construction method used for the building. Further, MHM probed inside the building's foundation and did not locate a poured concrete floor, further negative evidence that supports the Ice House identification. Lastly, records indicate that the Ice House also had a horse barn associated with it (Olson 1976, 203), but no archaeological evidence of this structure was identified.



The positions of the Ice House and the Men's Dormitory; they are at different elevations (Sanborn Map Company 1912).

Above: The Ice House foundation can be seen - after cleaning - from the ridge above it and to the northwest (MHM).

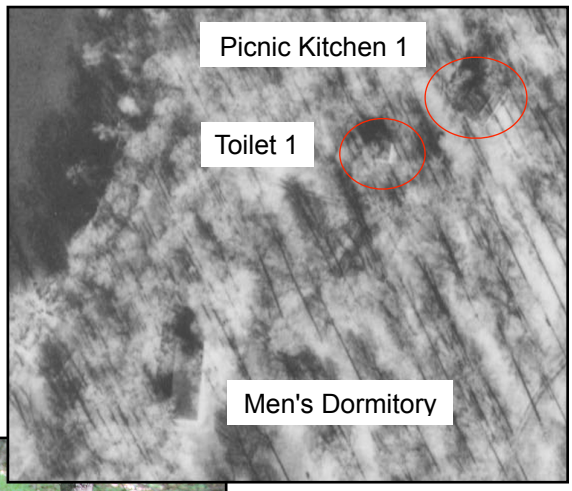
Below: The southeast corner of the Ice House (MHM).



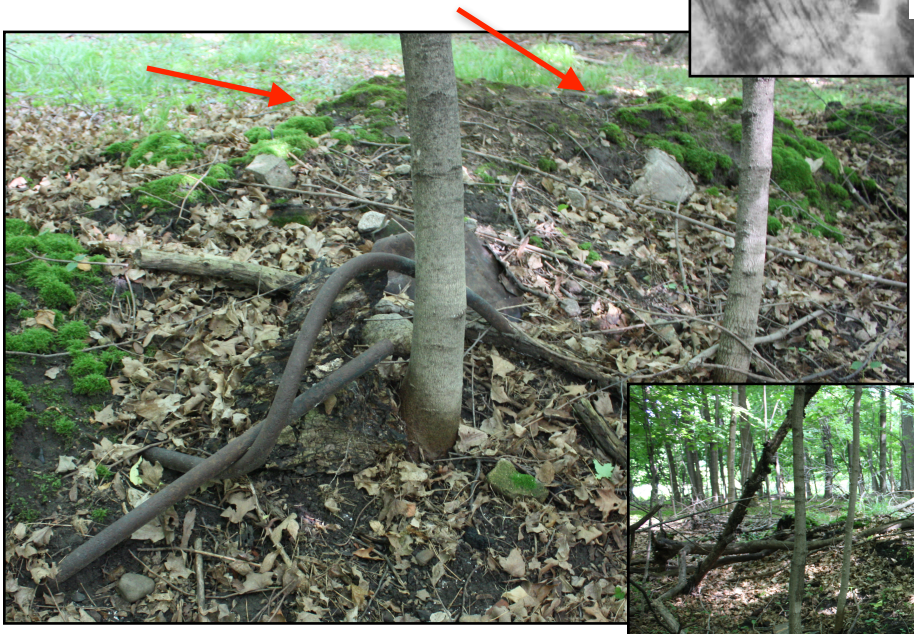
BIAP-BIVC Toilet 1

Originally, Toilet 1 (T1) was located near the Men's Dormitory; MHM suspects TI is the Men's Toilet, but its destruction does not allow for proper analysis of the structure. However, the Men's Toilet was 1 story tall, 36.00' long by 27.00' wide, and built using terra cotta brick, concrete, and stucco (Olson 1976, 203). MHM could not document the building's foundation *in situ* because the T1 currently lies in a mound-like earthworks and large midden scatter, including the TI Midden. T1 remained standing for decades after the BIAP closed, probably as a toilet facility for the BIVC. The last visual confirmation MHM has identified - through aerial photography - of a still-standing T1 is dated November 9, 1971 (John R. Borchert Map Library 1971).

Toilet 1 as seen from the southeast (ELMHS).



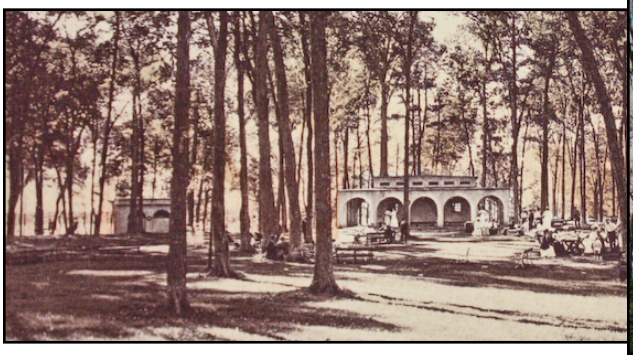
Toilet 1, Picnic Kitchen 1 (see below) and the Men's Dormitory (John R. Borchert Map Library 1971).



The arrows are pointing out the earthenworks of Toilet 1 that are basically large artifact middens mixed with matrix. A number of large artifacts are evident in the area as well, as seen in the image above (MHM).

BIAP Picnic Kitchen 1

Feature K1 Original represents the site of Picnic Kitchen 1 that lacks significant artifactual evidence of the building. However, Feature K1 constitutes a large midden of upheaved demolition rubble that made up the foundation floor for one of BIAP Picnic Kitchen1. It is located just to the northeast of the original location of Picnic Kitchen 1. Originally the building was 29.00' long by 20.00' wide, not including the Mission Revival Archway Portico that surrounded the building.[8] Picnic Kitchen 1 was rectangular with a slightly peaked roof and clearstory windows on all sides and the portico produced a walkway and shade around the building. The kitchen's exterior surface was completed with stucco and the roof - both on the building and the portico - was tiled with rounded terra cotta tiles. Picnic Kitchen 1 was constructed on a high and flat section on the northwestern section of the BIAP grounds. Feature K1 is comprised of large flat metal-reinforced concrete slabs - no longer *in situ* - that were dumped into a big pile along with metal straps, terra cotta bricks, electrical materials, shingle remains, and a possible Archway base. Feature K1 Midden is another, smaller collection of building materials associated with K1. The BIVC utilized Picnic Kitchen 1 for decades after the closing of the BIAP; at one point it was used as a multi-truck garage (Maravelas Chapter 12). Like Toilet 1, MHM identified a still-standing Picnic Kitchen 1 in an aerial photograph from November 9, 1971 (see above).



Toilet 1 and Picnic Kitchen 1 (ELMHS)

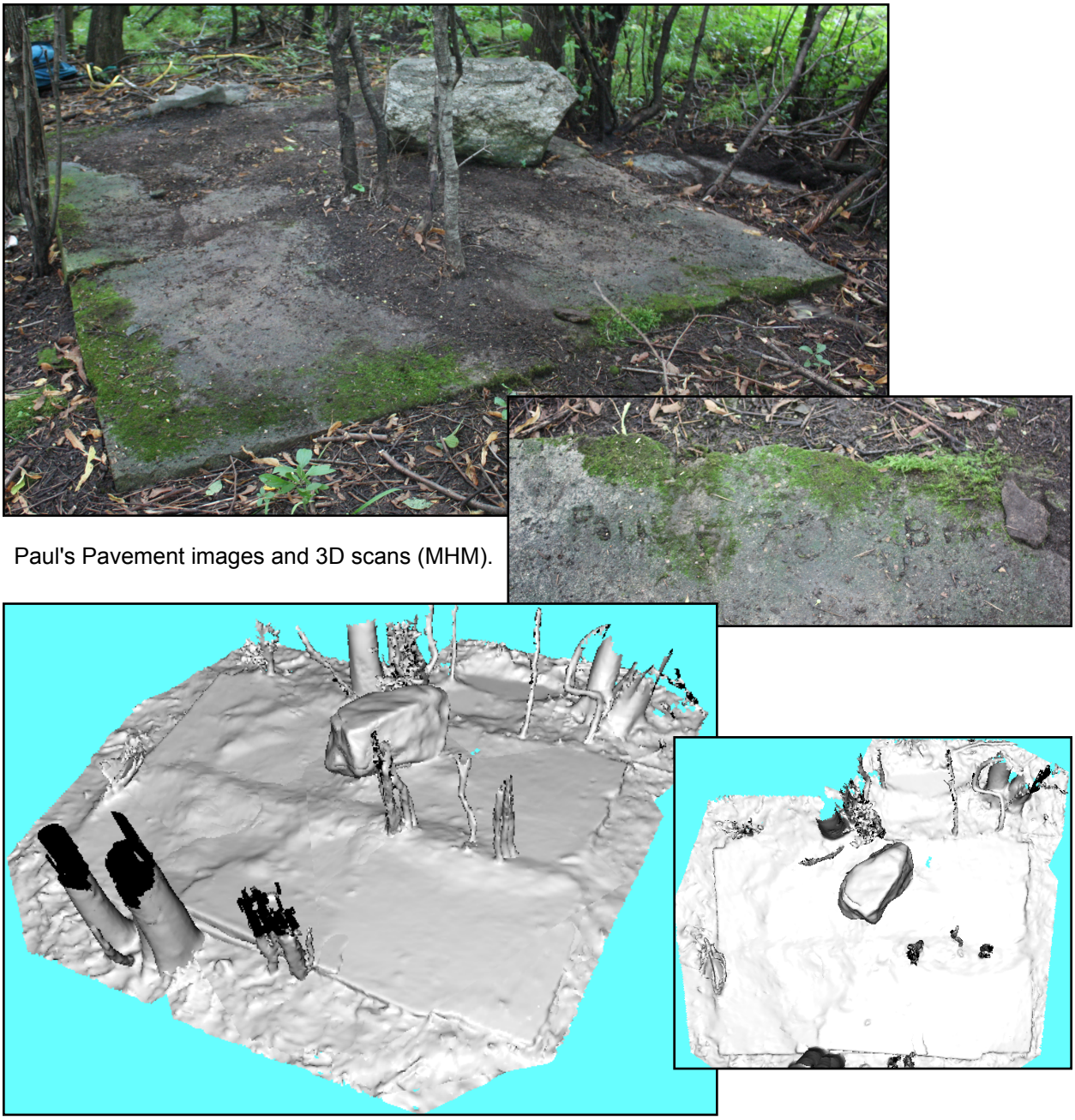
Picnic Kitchen 1 (MHM).

Two views of Feature K1(MHM).

[8]The footprint of Picnic Kitchen 1 - including its portico - was 65.00' by 40.00' (Sanborn Map Company 1912).

BIVC Paul's Pavement

A small 11.00' by 7.50' concrete slab located northeast of the BIAP Feature K1 - with a large rock on top of it - was once a small building. The concrete has impressions of metal I-beams imbedded in it and the corners are notched for vertical 2.00" by 4.00" wooden corner framing. Several small trees have broken through the slab, breaking it into pieces. Apparently 'Paul' finished pouring the concrete base at 8 PM on a day in 1970, according to the message set in the floor. Remnants of its fiberboard walls, a metal grate, window and/or door screen, and asphalt roof shingles are associated with Paul's Pavement. Other artifacts are nearby, including broken bottles, beer cans, and an old metal mop top. MHM does not know when the building on Paul's Pavement was torn down.



Paul's Pavement images and 3D scans (MHM).

BIVC Cabins 1-13[9] and Trailer

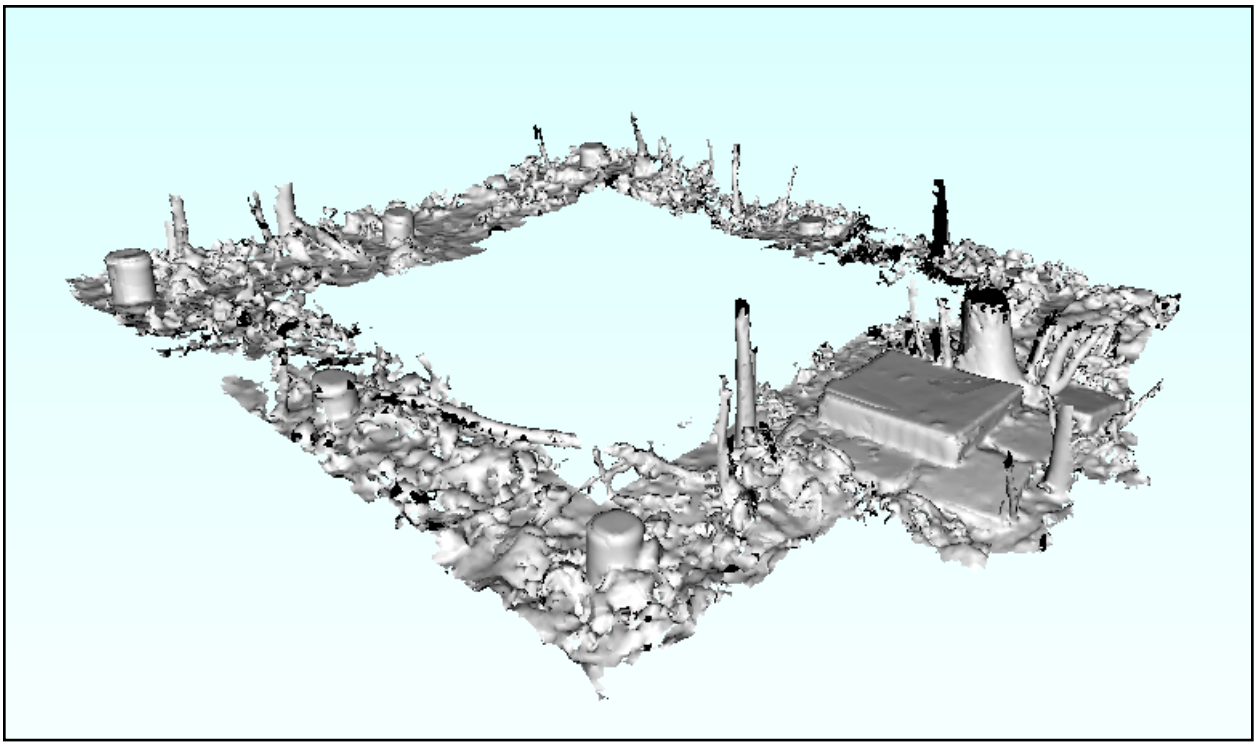
Physical evidence of BIVC Cabins in the project area varies depending on location and the type of cabin that was constructed in any particular place. In 1965, the BIVC manager Emil Berg reminisced that in 1925 there were "weeds higher than your head, a lot more left of the old amusement park, and just five cottages for campers" (Grim 1965). Using historical aerial photographic evidence and archaeological features identified in the project area, MHM has determined there were - at a minimum - 13 BIVC cabins on the northern end of the island[10]. Of these 13 Cabin Features, 10 of them have archaeological evidence consisting of concrete imbedded with cinder blocks - or the impressions of cinder blocks - round concrete cylinders, re-used BIAP platforms that served as front steps, artifact middens containing BIAP terra cotta bricks and concrete and BIVC artifacts throughout the area, and an intact re-used BIAP floor foundation. Three of the BIVC cabin locations - confirmed by photographic evidence - have left no discernible physical footprint. During the formative years of the BIVC, 'tent cabins' were constructed - buildings designed in the spirit of military field structures - on the northern side of the project area. The tent cabins were placed on short stacks of 'stilts' comprised of re-used BIAP terra cotta bricks and cinder blocks - often embedded in concrete. At a later time, the tent cabin 'roofs' were replaced with shingled wooden roofs, transforming the buildings into true cabins. In addition to the tent cabins, wooden buildings with foundations more consistent with traditional framed building design were also constructed. During this project, MHM identified 6 tent cabins in this group (Features C1, C2, C4, C5, C7, C8) archaeologically and pictorially, and another 2 tent cabins (C3, C6) left no physical signature, but are seen in photographs. MHM identified another 5 wooden framed BIVC cabin locations (Features C9, C10, C11, C12, C13) associated with *in situ* archaeological evidence and aerial photographs. MHM 3D scanned Feature C8 since it incorporated BIAP and BIVC features in its design, and much of the evidence was i*n situ*. In 2007, MHM photographed 4 of the surviving cabins (Features C9, C10, C11, C13), the re-used BIAP step that represented C12, and a mobile home that was comprised of 2 short single-wide trailers attached to each other; a midden is associated with C13 (C13 Midden). The trailer also had a porch constructed onto its south side, and re-used BIAP concrete slabs were utilized as a small Trailer Patio (TP) next to the porch.[11] The 4 cabins were demolished and the trailer removed between 2007 and 2010; the TP and C12 BIAP step were thrown to the west of the trailer location, creating a small midden (TP Midden).

Left: The round 'stilt' supports and re-used BIAP step of C8. Right: The re-used BIAP step (MHM).

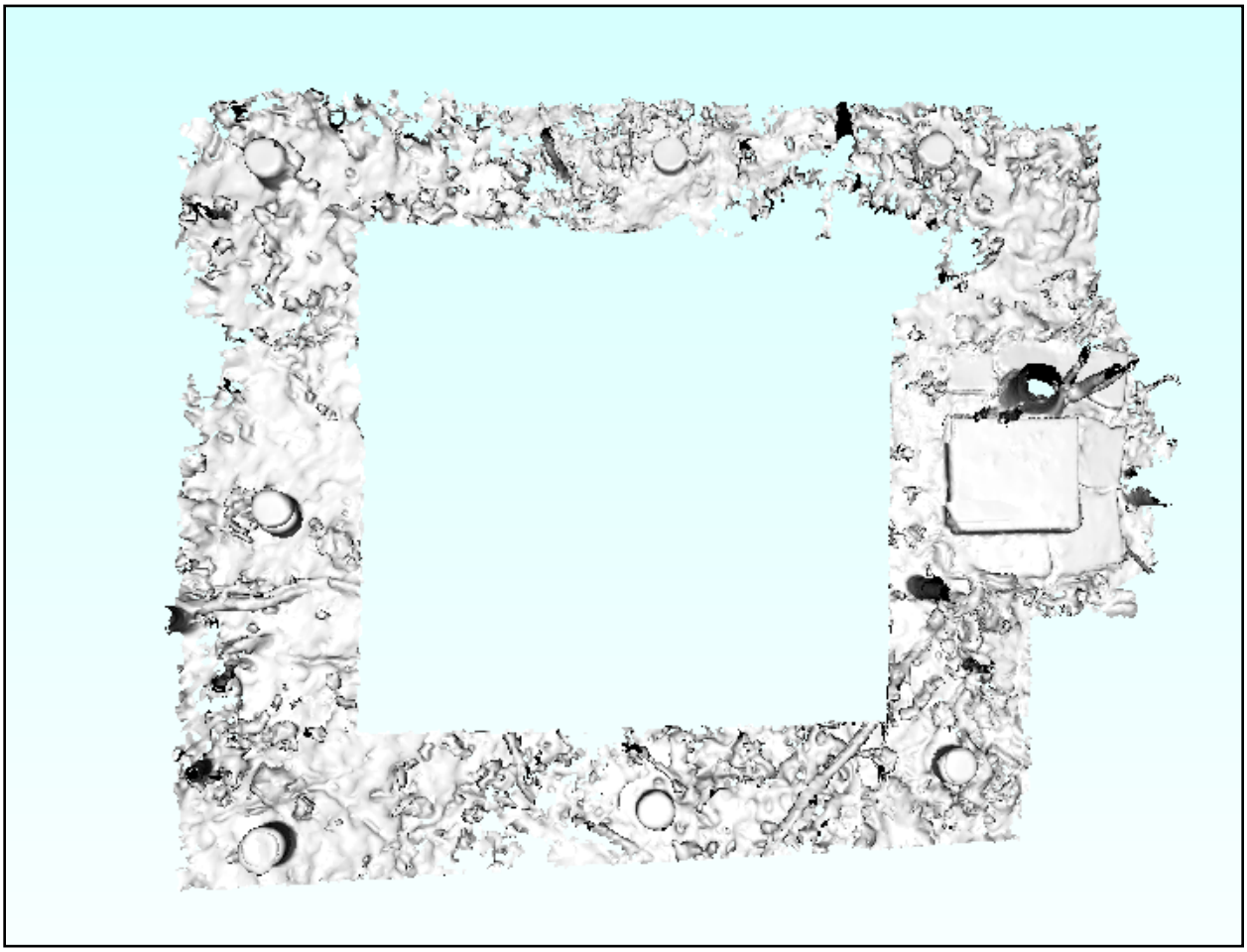
[9]The numbering system used by MHM for this project do not coincide with the actual alphanumeric system the BIVC used to identify each structure.

[10]Definitive pictorial evidence of the northern project area dates to 1962 (John R. Borchert Map Library 1962).

[11]The trailer was used by the BIVC camp manager during its last years of operation.

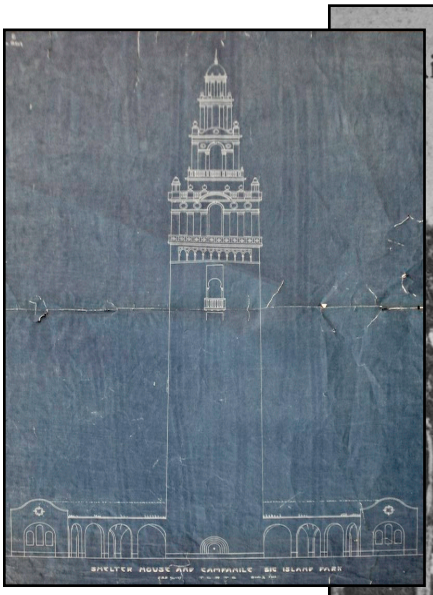


MHM's 3D scans of the C8 Tent Cabin feature.

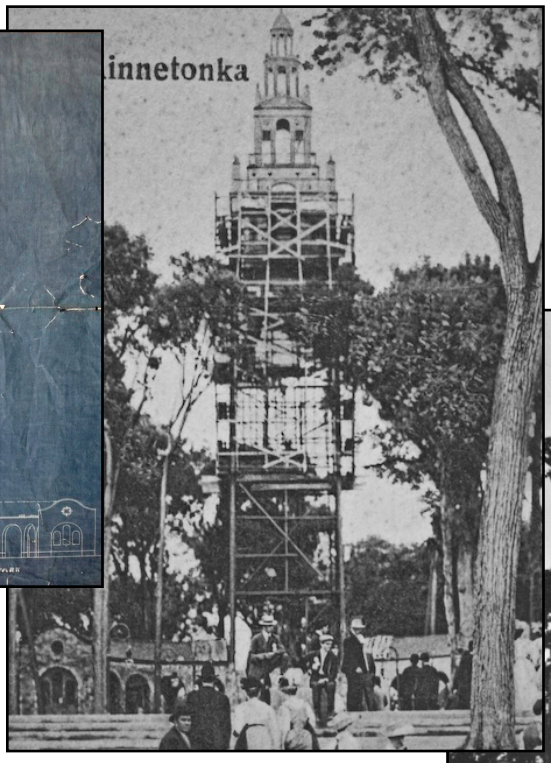


BIAP Water Tower, Well, and Shelter House-BIVC Mess Hall

To the southwest of the cabins and trailer described above, a hill with the highest elevation in the project area was the location of the BIAP Water Tower, Well, and Shelter. The construction was described as including "an artesian well 400 ft. deep, furnishing a fine water supply, and we store our water in a steel tower covered with concrete and studded with electric lights. This tower is a close copy of the famous tower of Seville, Spain, and makes an attractive ornament to the island. At the base of the tower there is a shelter house" (Warnock 1908, 108). The Shelter House emulated the Mission Revival Archways and was in reality, a semi-circular arcade with doors on either end. The Water Tower was 186.00' high with a 25.00' square base. When the BIAP closed, the Tower remained standing for a time and was described during a winter train ride west to Hutchinson. The train's passenger concluded that "a vast plain of dazzling whiteness that is recognizable as Lake Minnetonka only by familiar islands and distant points and the faraway symmetry of the crumbling Spanish tower on Big Island"; the Water Tower remained an icon on the lake beyond its use as part of the BIAP (Storrs 1917). It was reported that the Water Tower was "cut loose and collapsed" during the winter of 1918 by a local work crew, and the scrap metal produced went over the ice to Deephaven for recycling (Elwell and Elwell 1975, 16-17). During 2019, MHM located 2 blocks of Tower/Shelter concrete - the *in situ* TS FoundationBlock1 and the dislodged TS FoundationBlock 2. Further, 2 middens (TSMidden1-2) may be associated with the destruction of the Tower and Shelter.



The blueprint of the Water Tower and Shelter (Buffington 1906).



The Water Tower under construction after the BIAP had opened; note the large water tank near the top of the tower (ELMHS).

The Water Tower and Shelter after the BIAP had closed (ELMHS).

The Shelter as seen from The Mall (MNHS MH5.9ORr2)

The BIAP as seen from a steamer (MNHS MH5.9ORp18).

On the same site, the first BIVC Mess Hall was constructed in 1920 and it was destroyed by fire in 1924; many tents were stored in the building as well, and they were a complete loss (Grim 1965). The 'new' BIVC Mess Hall, also constructed on the footprint of the Water Tower, was a framed wooden structure with a large front porch. The building was situated with the front entrance to the south, aligned with the concrete stairs that still survived from the BIAP Water Tower. Also, the BIVC used the Well throughout its history. The Mess Hall stood until it was intentionally burned down in June 2006, and the BIAP concrete stairs were torn out of the ground using a backhoe. As mentioned above, during MHM's archaeological work on the island in 2007, small test trenches on the Water Tower/Mess Hall mound exposed hundreds of small artifacts - along with some larger objects - that are still in the matrix and covered in tall grass. The BIAP well shaft remains under the mound created for the Water Tower and Shelter House, and the large footprint of the BIVC Mess Hall is essentially a large filled-in trench. A Phase II - or possibly a Phase III - excavation of this large archaeological feature could answer questions about the construction of not only the Mess Hall, but the Water Tower and Well. The aforementioned TS FoundationBlock1 and TS FoundationBlock 2 may have beeb reused by the BIVC in the Mess Hall's foundation

construction. Lastly, Concrete Stairs from the BIVC that led from the rear of the Mess Hall are still located *in situ* and undamaged, leading down the mound to the north.

Above: The BIAP Water Tower and the BIVC Mess Hall superimposed.

Left: The BIVC Mess Hall in 2003 (MHM).

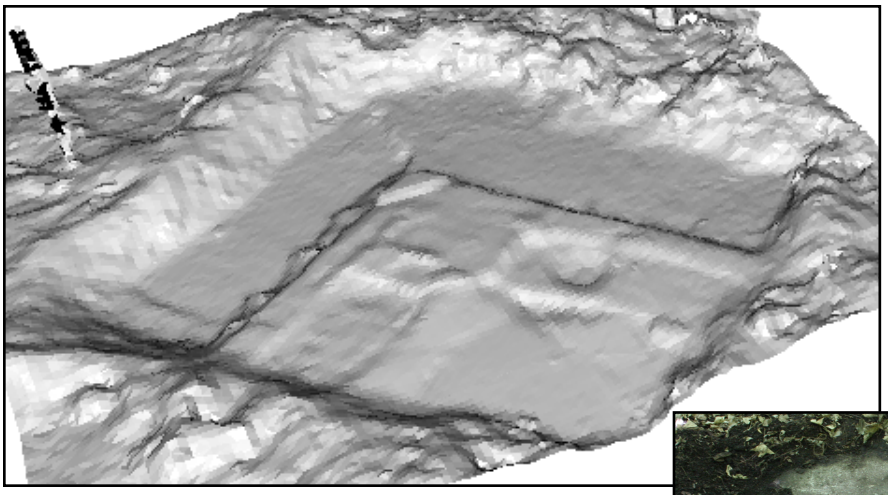
Right: The Water Tower/Mess Hall site in 2007 (MHM).

BIAP Picnic Kitchen 2-BIVC Fish Shack

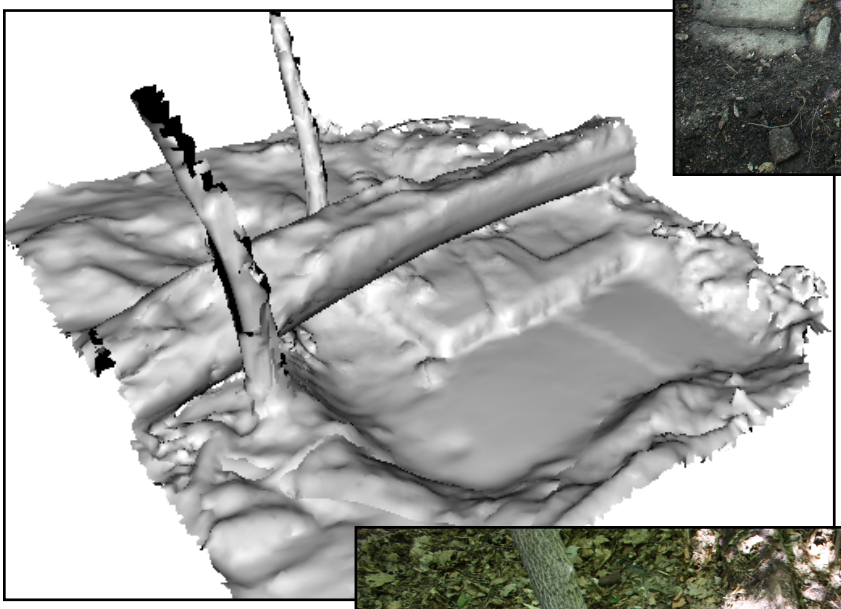
Picnic Kitchen 2 (K2), northeast of the Water Tower/Shelter/Well/Mess Hall Features, is the concrete and terra cotta brick foundation of another BIAP Picnic Kitchen and the location of a wooden BIVC Fish Shack. The original dimensions and design of K2 were identical to K1 above. The building survived for decades beyond the demise of the BIAP, and in an October 1957 aerial image, it existed as a ruin. By May 1960, Picnic Kitchen 2 had been demolished; currently the foundation measures 55.00' by 40.00' in size. MHM 3D scanned specific areas of the foundation that clearly depicted the building's terra cotta brick, mortar, and concrete construction. The Fish Shack, in place by May 1960, was constructed on K2's foundation in an area that took advantage of a BIAP drainage system. The small wooden building was designed with kitchen-like counters and a sink for scaling and gutting fish, and was screened on all sides to provide thorough ventilation. The Shack is 10.20' by 8.40' in size. The Shack's roof is damaged, but its walls are relatively intact and strong. MHM 3D scanned sections of K2's pavement that depicted diagnostic attributes of its construction.

Above: Picnic Kitchen 2 looking toward the northeast (ELMHS).

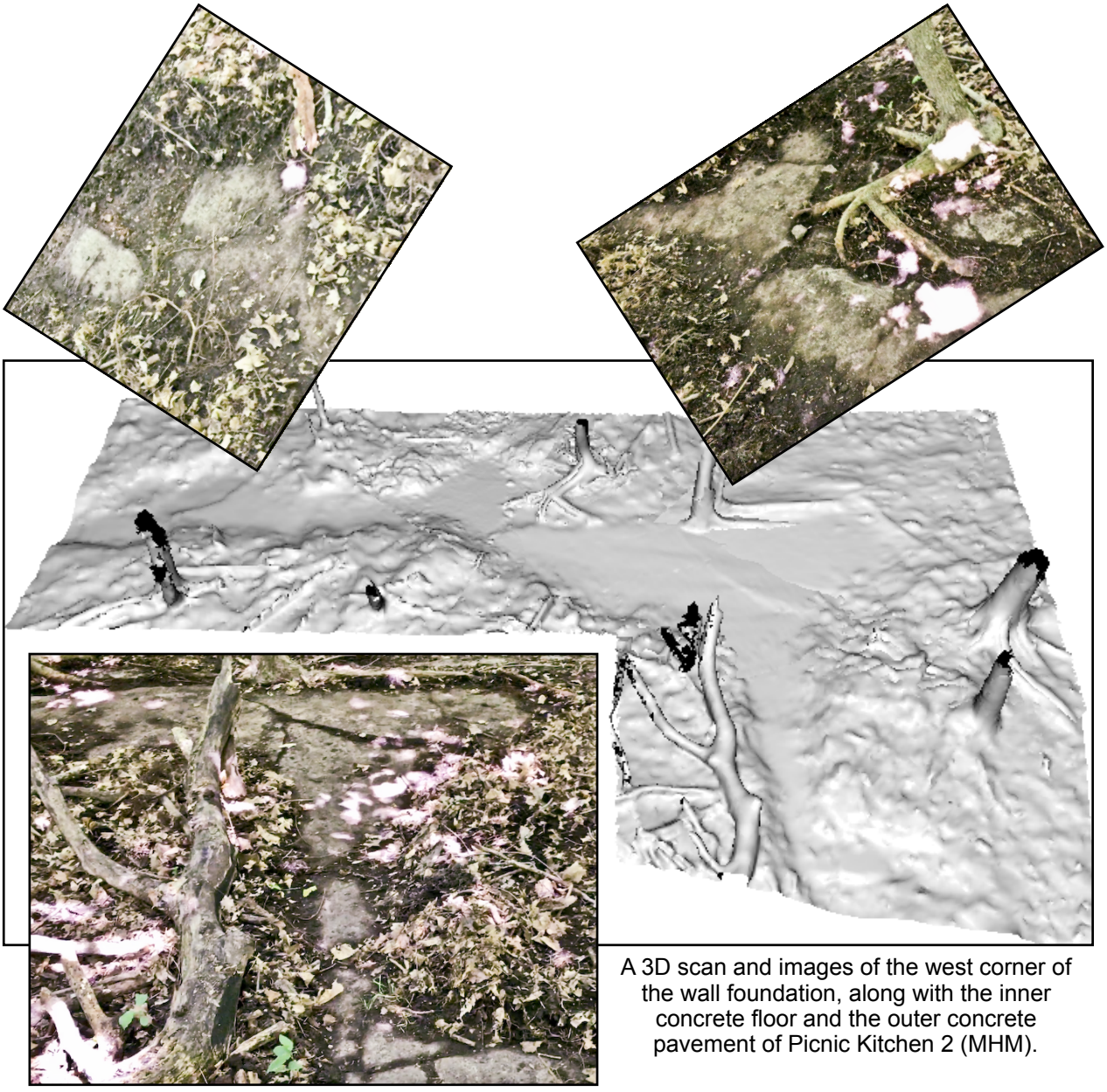
Left: Picnic Kitchen 2 (TCRT 1907).



A 3D scan and image of the north corner of the wall foundation, along with the inner concrete floor and the outer concrete pavement of Picnic Kitchen 2. Note the terra cotta crick remnants (MHM).



A 3D scan and image of the east corner of the wall foundation, along with the inner concrete floor and the outer concrete pavement of Picnic Kitchen 2. Note the terra cotta brick remnants (MHM).



A 3D scan and images of the west corner of the wall foundation, along with the inner concrete floor and the outer concrete pavement of Picnic Kitchen 2 (MHM).

Left bottom: The BIVC Fish Shack (MHM).

Below: BIAP drain D3 (see below) re-used by the BIVC (MHM).

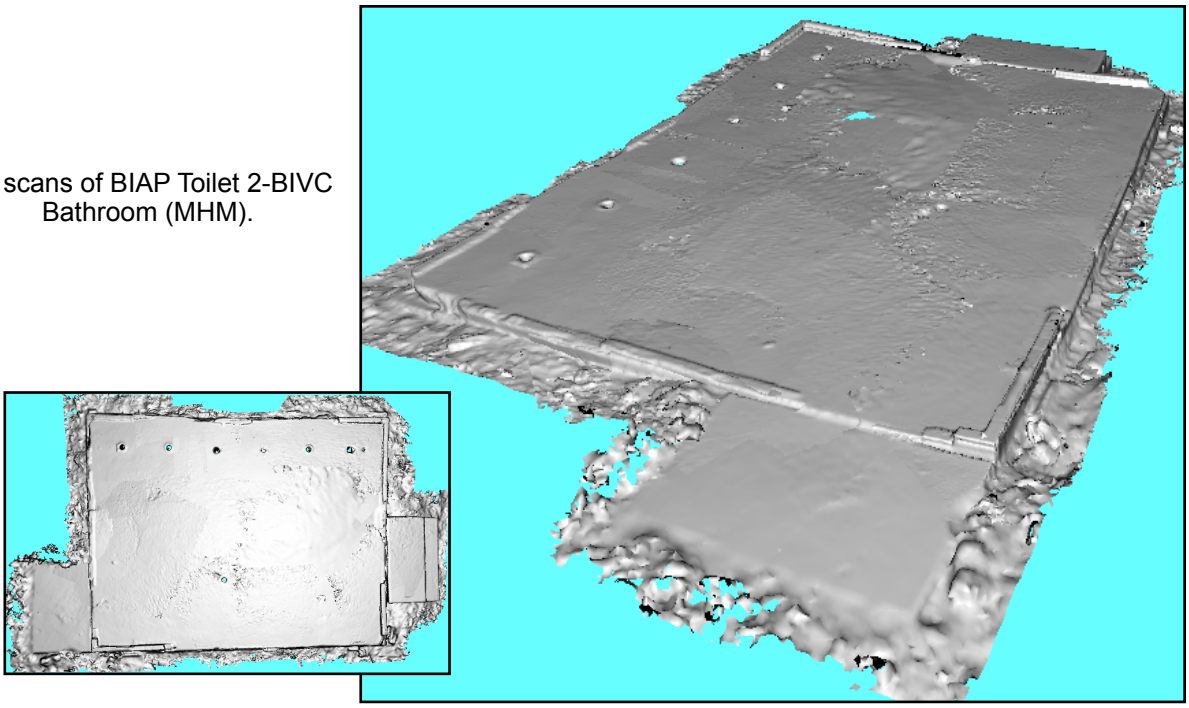
BIAP Toilet 2-BIVC Bathroom

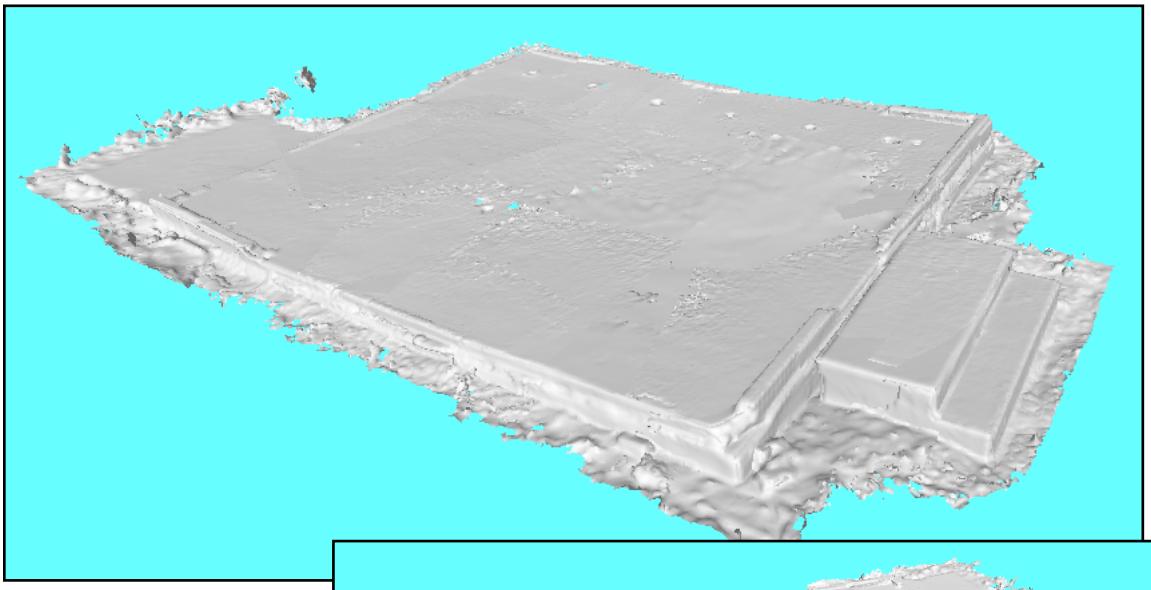
South of Feature K2, a concrete platform with several holes formed into its base, represents the remains of Feature T2 - the BIAP Toilet 2. Originally Feature T2 measured 20.00' by 20.00' and was constructed of terra cotta brick and concrete to resemble the Mission Revival Archways and stucco construction of the other BIAP buildings. At some point, the BIVC dismantled the building's walls, laid down concrete bricks around the periphery of the foundation, poured a new concrete floor, and constructed a new bathroom structure out of solid concrete bricks. The new floor respected the drainage holes for toilets - and maybe some newly installed shower stalls - and it was painted blue. The BIVC renovation may have included the addition of another entrance to the building, allowing for the partitioning of the building into distinct toilet and shower areas, and/or divide the building into 2 spaces for different genders. MHM suggests this conclusion because Feature T2 had 2 entrances across from each other on the north and south sides. On the north side a rectangular step provided a firm foundation to step into the building on that end. The south side, 2 steps allowed access into the building; MHM does not know if these attributes are original to the BIAP version of Feature T2 or if they were formed by the BIVC. At the northeast corner of the building, an *in situ* BIAP metal pipe runs north to south and parallel to the foundation. Another BIAP metal pipe protrudes 12.00" out of the ground and about 18.00" from the northeast corner of Feature T2. Just to the south of the vertical pipe, a 'modern' PVC pipe with 2 hose clamps attached to its end lies loosed on the ground. MHM 3D scanned the entirety of the Toilet 2-BIVC Bathroom; the BIVC Bathroom was torn down by 2007. MHM 3D scanned Feature T2 during the 2019-BI Project.

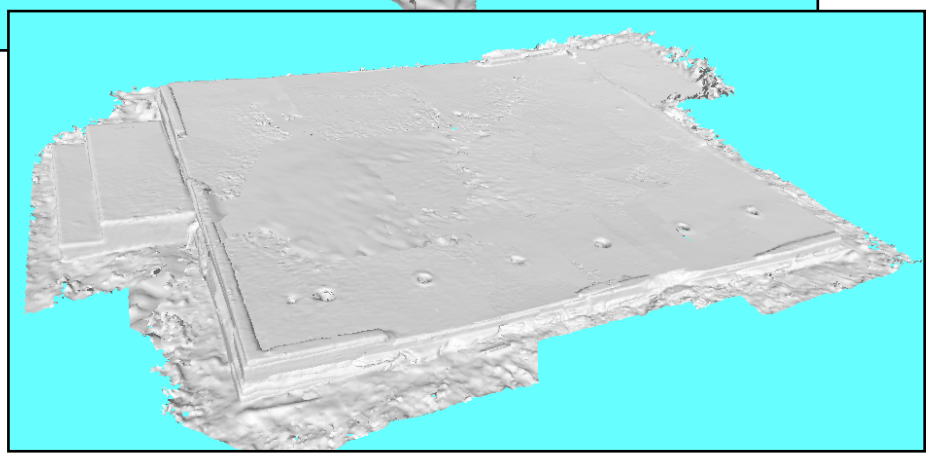
The BIVC Bathroom in 1955, constructed on the original footprint of BIAP Toilet 2 (ELMHS).

The concrete slab floor of BIAP Toilet 2 with the BIVC Bathroom floor poured on top of the original (MHM).

3D scans of BIAP Toilet 2-BIVC Bathroom (MHM).

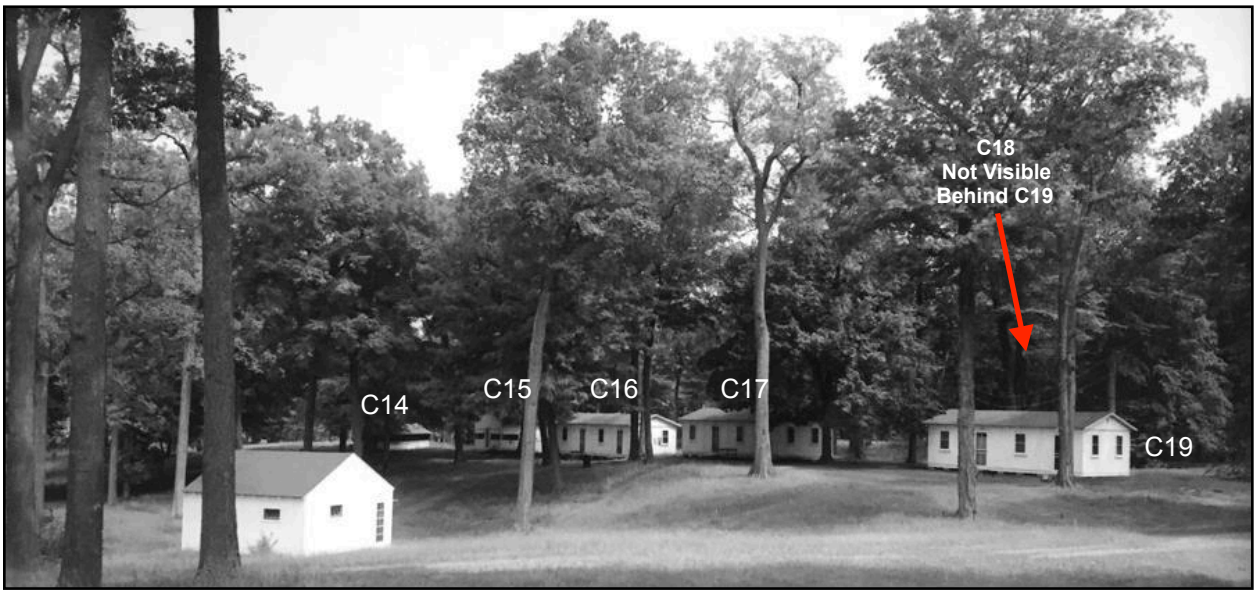






BIVC Cabins 14-19

To the east of BIAP Women's Toilet 1-BIVC Bathroom feature, MHM identified an additional 6 cabin features. Three of the features (C14, C15, C18), based on the archaeological evidence recorded in those areas and compared with photographic images, were originally of the tent cabin type. However, Feature C14 left no physical evidence behind, only photographic, and it appears that Feature C18 was burned. Features C16, C17, and C19 are represented as a series of artifact middens and *in* situ building foundations. Further, C15, C16, and C17 incorporated BIAP building materials within them; C16 is currently comprised of an L-shaped concrete building foundation associated with BIAP terra cotta tile and concrete. This relationship indicates the BIVC construction workers utilized BIAP materials that were available and useable in their new structures. MHM does not know when Cabins 14-19 were demolished, but Cabins 15-19 were extant in an April 1962 aerial photograph, and Cabins 15-17 and 19 still stood in 1971 (John R. Borchert Map Library 1962, 1971).



The BIVC Bathroom is located on the left side foreground of the image. There are 5 cabins visible in the image above; C18 is behind C19 (ELMHS).

The BIAP re-used concrete slab step and the BIVC cinder block 'stilts' of 'cabin tent' C15, and porcelain artifacts from C19 (MHM).

BIVC Garages, Cook's Cabin, and Unknown Small Building

South of Feature T2, 2 concrete floors/platforms are located at the edge of the clearing that extended east of the Water Tower. The eastern-most platform - Feature G2 - currently supports a steel storage unit that houses the island's lawn mower. In 2007 MHM photographed exterior and interior of the cinder block garage that stood on the foundation. To the west, Feature G1 was a garage with a stucco exterior; it was also standing in 2007. Further west, the BIVC Cook's Cabin (Feature CC) was not constructed on a concrete slab, but the building stood for decades and it survives in the form of a midden. Another small building can be seen in a 1988 architect's rendering of the BIVC, but MHM has never seen this building and it is hard to discern from the trees in historical aerial photographs. MHM determined where the Small Building was located and identified the Small Building Middens 1 and 2; they consists of 2 mixed material middens that have a toppled brick chimney - that was set onto a cinder block base - as its largest attribute. The building's function is unknown, and it was torn down sometime between 1988-2007. Lastly, a Rounded Foundation south of the Small Building and its Middens, may be from the BIAP or the BIVC; further research into this feature is required before it can be identified.

BIVC cinder block Garage 2 and stuccoed Garage 1 as they appeared in 2007 (MHM).

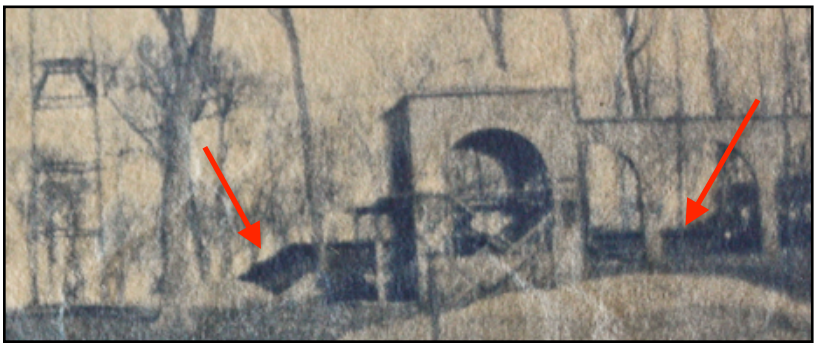
The concrete slab of G1 is in the foreground and the steel storage unit on the G2 foundation is in the background (MHM 2019).

Building construction artifact middens associated with the BIVC Cook's Cabin and an unknown BIVC Small Building (MHM).

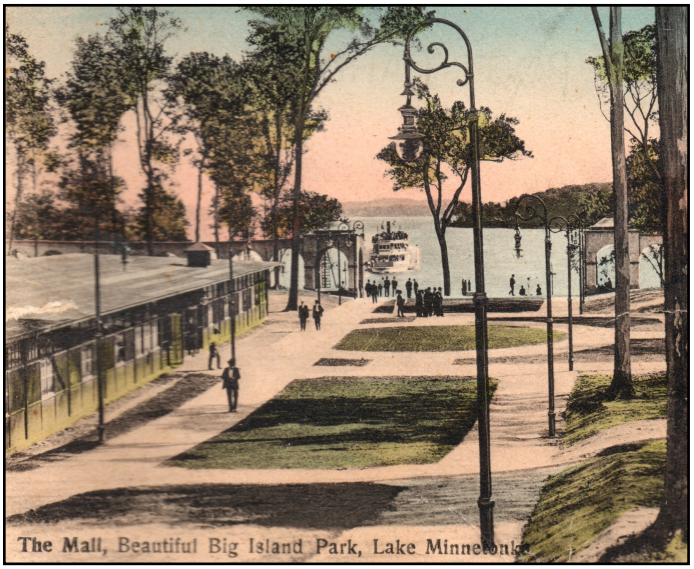
BIAP Refreshment and Dance Pavilion

To the southwest of the Cook's Cabin - and bordering The Mall that once provided groomed walking paths for BIAP patrons in front of the Water Tower - remnants of the BIAP Refreshment and Dance Pavilion are found. Most of the archaeological evidence in the area is comprised of artifact scatters such as metal buckets and cans - that can be intrusive and not in situ - to collections of concrete infrastructure that are components of the Restaurant/DancePavilion. The building itself was constructed of wood, it was built during the early construction phase of the BIAP, and was supposed to be a temporary structure. However, the Restaurant/Dance Pavilion remained in place until the BIAP closed in 1911 (Warnock 1908, 108). The most conspicuous attribute of the Restaurant/Dance Pavilion is the 6 large concrete slabs (RDP Entrance Pavement) - that resembled a sidewalk -but acted as the entrance to the building. The slabs are *in situ*, but they are also slowly sliding down into the rectangular footprint of the building's former location. The building was 203.00' long and 62.50' wide; the rectangular feature that is obvious in historical aerial photography and is identifiable through much foliage today, supports this data. Unlike most of the BIAP buildings designed for public use, the Restaurant/DancePavilion was constructed of wood. Four of the concrete slabs are 6.00' by 6.00' in size, 1 of them is 4.20' by 6.00', and the 6th slab is formed around a large round ceramic water drainage pipe (RDP Sewer Pipe). This 6th slab is separate from the others, lying 8.00' to the north of them. Further, a tree growing out of the southern-most slab has split it into 2 pieces; 2 trees are growing between slabs 4 and 5, causing the latter to more quickly slip down the rectangular gully left by the building. MHM cannot determine if a section of the entrance slab is missing between concrete

sections 5 and 6. North of the RDP Entrance Pavement, the RDP Foundation Block is found, not *in situ*. Lastly, MHM does not know when the BIAP Refreshment and Dance Pavilion was torn down. However, an undated image of the Water Tower clearly depicts The Mall as overgrown and un-groomed, indicating the image was taken between 1912-1918. Importantly, in this image, the Refreshment and Dance Pavilion's northwest corner was intact at that time. The building itself cannot be seen in some historical aerial photographs, but often the RDP Entrance Pavement and the outline of Restaurant/ DancePavilion is clearly discernible in several images from 1956, 1960, and 1967 (John R. Borchert Map Library, 1956, 1960, 1967).

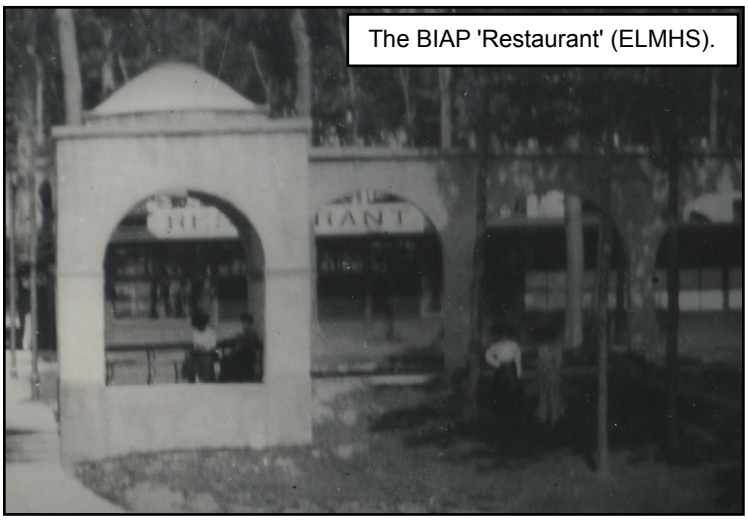


The Refreshment and Dance Pavilion Building was built early-on during the construction of the BIAP and remained in place throughout the life of the Park. It can be see behind the East Gazebo under construction (Buffington 1906).

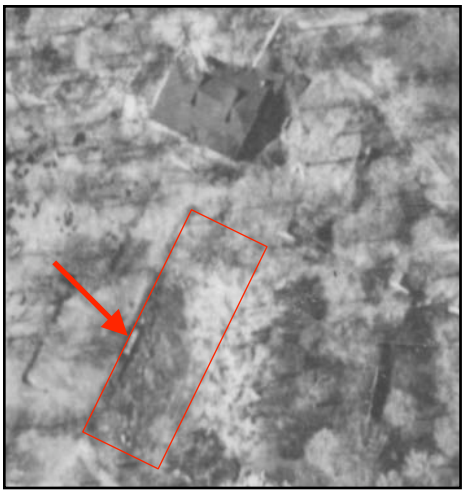


The Refreshment and Dance Pavilion Building is on the left side of this post card. Note the change in The Mall's landscaping where the large circle is seen; it could not be completed because the 'temporary' building became a permanent fixture and the walkway was place through the circle (MHM Collection).

The Refreshment and Dance Pavilion is on the right side of this image; note the 'ghosts' walking by due to a long exposure (MNHS MH5.9ORr2).

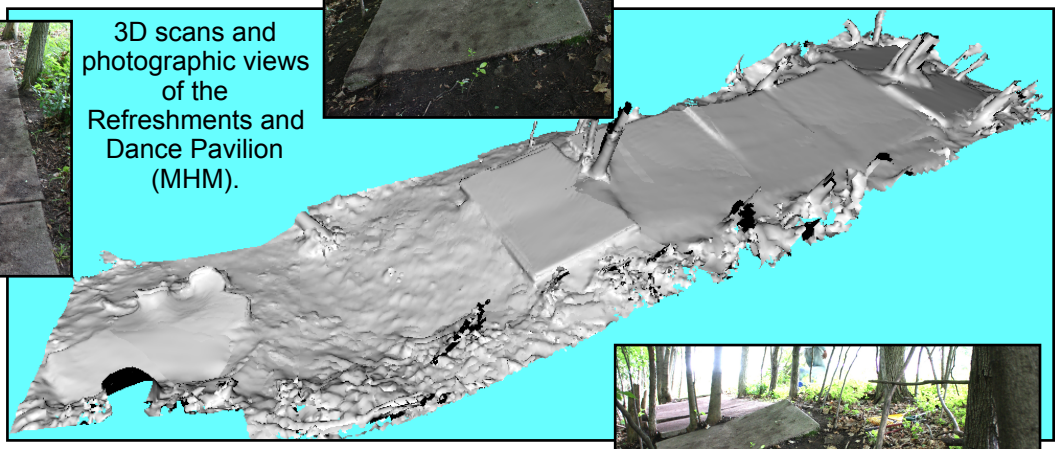


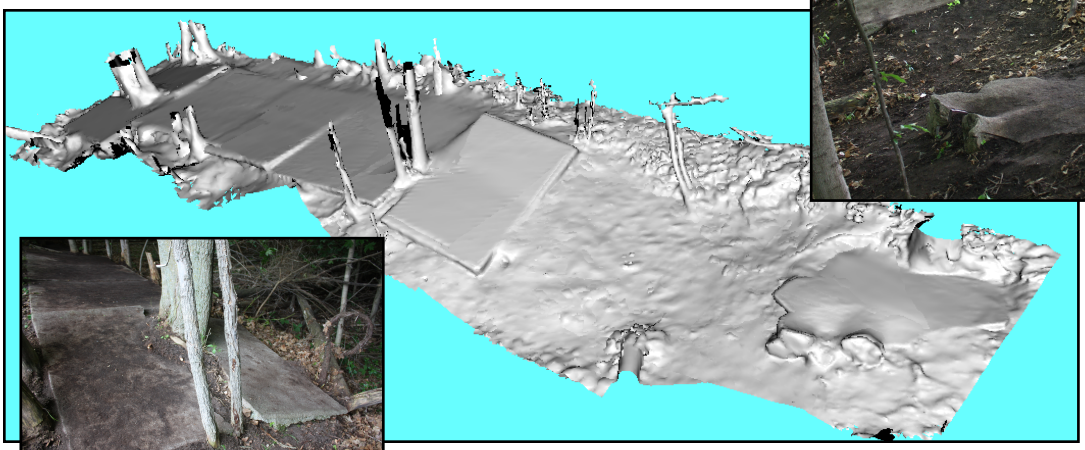
The BIAP 'Restaurant' (ELMHS).

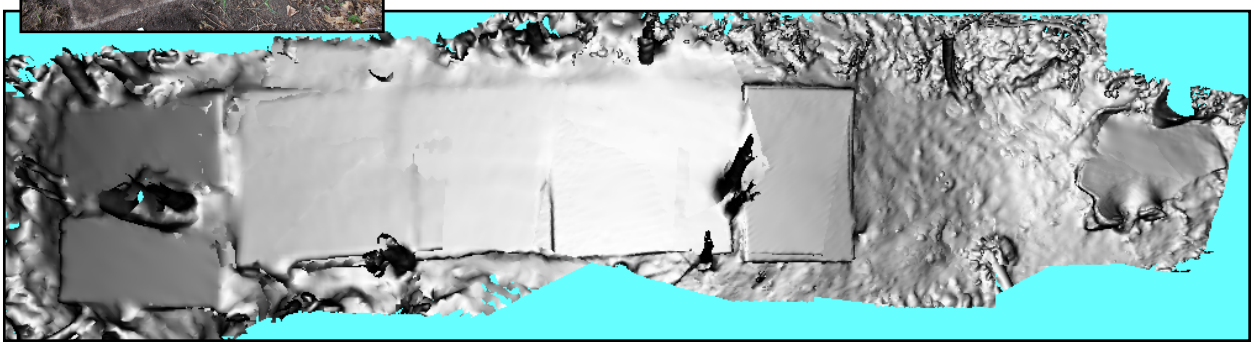


The Refreshment and Dance Pavilion entrance pavement is clearly visible in this 1956 aerial photograph (John R. Borchert Map Library).

3D scans and photographic views of the Refreshments and Dance Pavilion (MHM).







BIAP Mission Revival Archways: East-West and Toilet 3

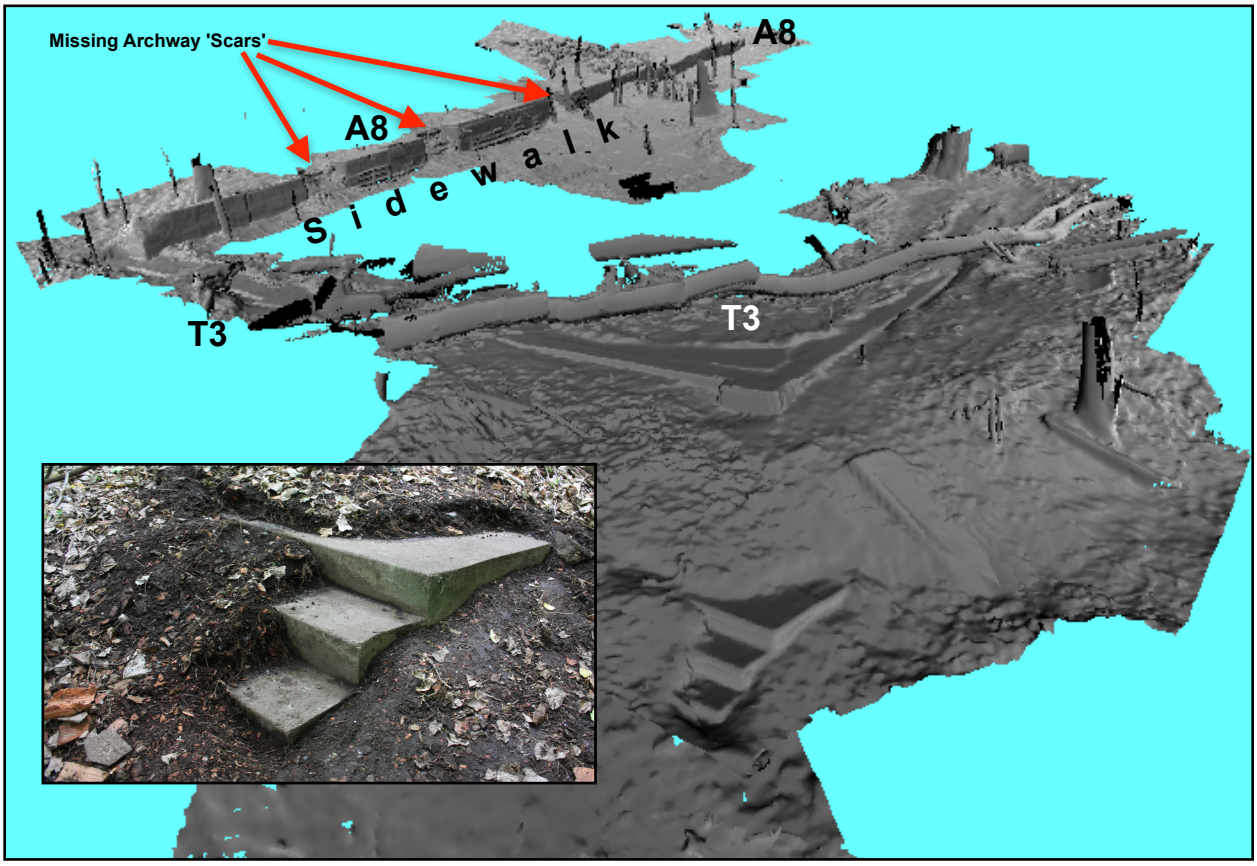
As described above, the BIAP Mission Revival Archways were constructed around the island and acted as guides to amusements and picnic offerings. A group of Archways running East-West (Feature A8) to the northeast of the BIAP Refreshment and Dance Pavilion and south of the Small Building Middens, CC, and G1, provided a northern border for a sidewalk and acted as a guide to find Toilet 3 (Feature T3). From its westernmost point, Feature A8 is 65.00' long and clearly shows the 'scars' where Archways once stood. These sections of the Archway system are particularly helpful in answering questions about the feature's construction - similar to Feature A1 - using mortared terra cotta brick reinforced with concrete and faced with stucco. Feature A8 as an *in situ* and existing 'wall' is the most complete above-ground example of what the system of Mission Revival Archways visually represented as an icon of the BIAP. Running parallel with a poured concrete sidewalk that would allow island visitors to access Toilet 3, the Water Tower, and the Refreshment and Dance Pavilion. The sidewalk is 6.00' wide and it 'joins' Feature A8 with Feature T3. Feature T3 measures roughly 16.00' by 20.00', although a small extension off the northeast corner of the building increases its east-west footprint at that end to 20'. MHM did not expose the entire poured concrete floor and interior walls of Toilet 3 for 2 reasons: 1. Only surface cleaning a section of the feature answered MHM's archaeological questions about it; and 2. Large fallen trees cover most of the building's foundation and moving them was beyond the scope of this project.

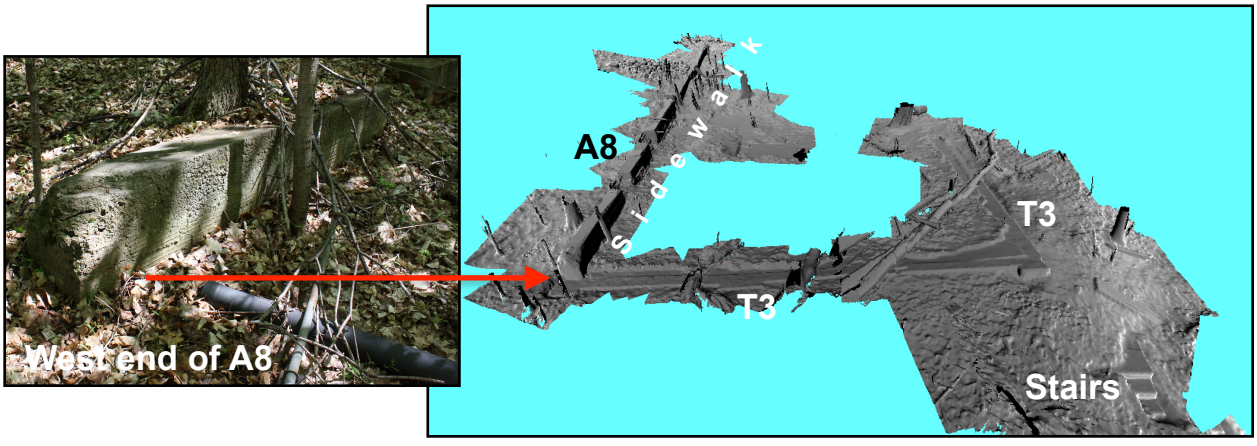
Left: Toilet 3 is seen as the L-shaped building and the row of Archways (Feature A8) shown as dots is heading to the west (Buffington 1906).

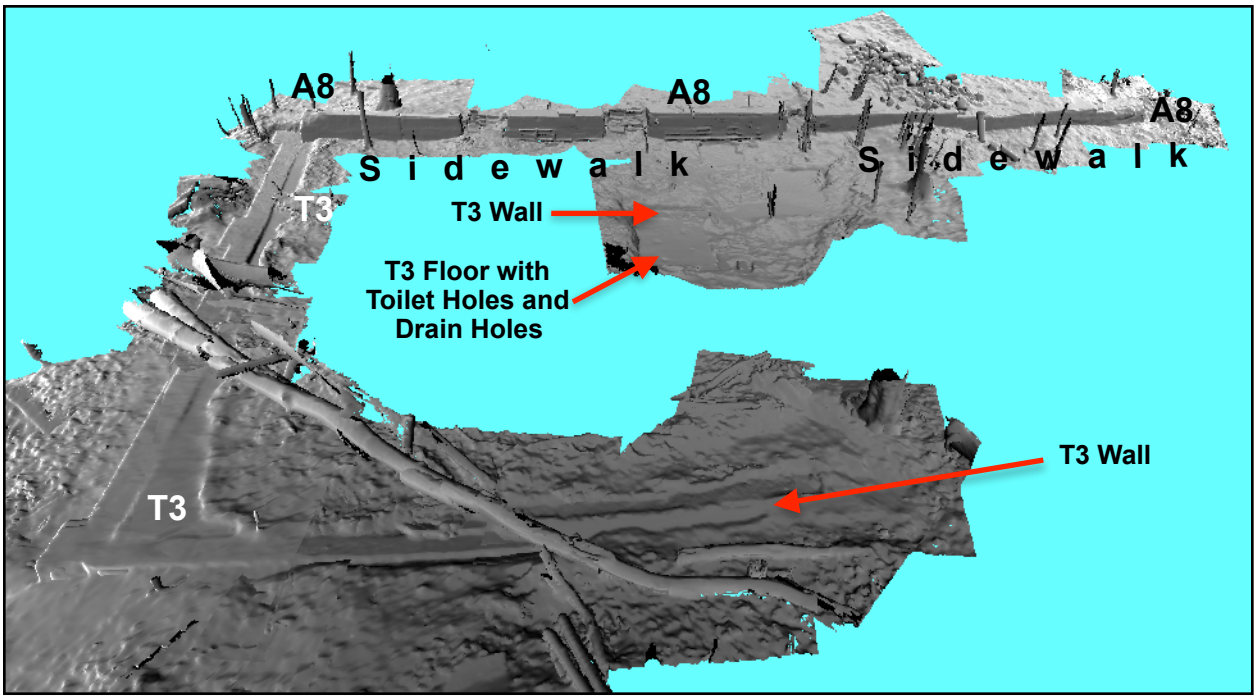
Right: Looking toward the northwest, this image is the only photograph MHM has located to date that depicts definitively Toilet 3 (ELMHS).

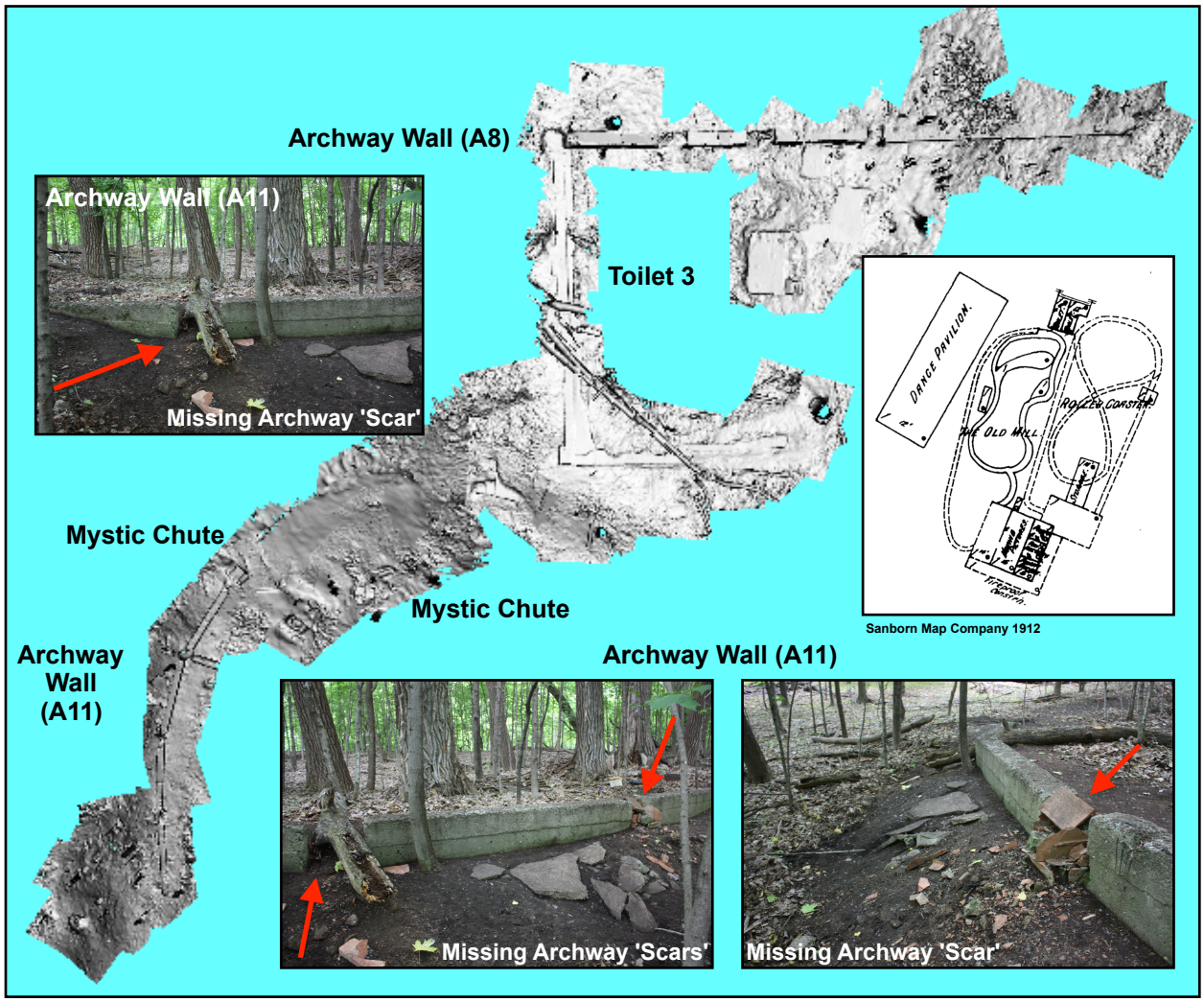
Since Feature T3 is clearly associated with the BIAP Mission Revival Archways: East-West, the BIAP Toilet 3's construction was likely integrated into that of the Archways. It is possible that the roof of the building may have extended to the Archways and provided a covered walkway for this section of the park. MHM cleared the northeast corner of the toilet building and exposed the wall sections and holes formed out of the concrete that secured sewer pipes where toilets or sinks would have rested. The outer

wall foundation of Feature T3 was entirely cleared; 2 wider sections of the wall on its west side possibly marked the locations of windows - entranceways into and out of the building. At the southwest corner of the Women's Toilet 2 feature, a small flight of stairs with at least 3 steps was exposed. It appears the stairs were designed to lead visitors from Feature T3 to the Restaurant and Dance Pavilion; if this is not the case, people would be walking between the Pavilion and the wall of the BIAP Mystic Chute. MHM 3D scanned Features T3 and A8, with the exception of the large fallen tree pile in the middle of Toilet 3. MHM does not know when Feature T3 was torn down or fell down, but it can be seen in aerial photographs from 1937. In later images, the trees obscure either the building, its ruins, or the matrix covering the archaeological feature.



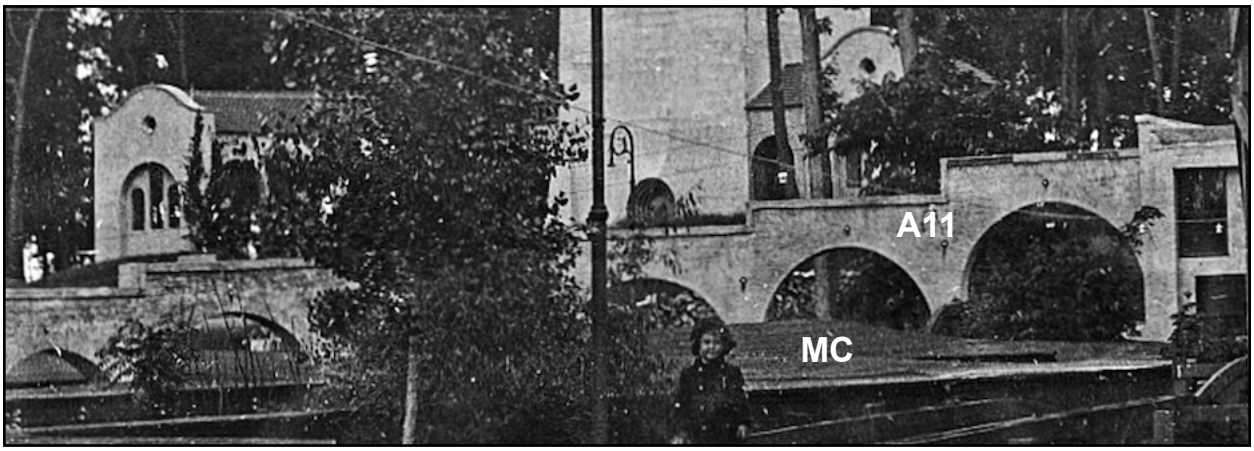



A8
A8
A8
S i d e w a l k
S i d e w a l k
T3
T3 Wall
T3 Floor with
Toilet Holes and
Drain Holes
T3 Wall
T3


Archway Wall (A8)
Archway Wall (A11)
Missing Archway 'Scar'
Toilet 3
DANCE PAVILION
ROLLER COASTER
THE OLD MILL
Sanborn Map Company 1912
Mystic Chute
Mystic Chute
Archway
Wall
(A11)
Archway Wall (A11)
Missing Archway 'Scars'
Missing Archway 'Scar'

BIAP Mystic Chute

MHM has been studying the BIAP Mystic Chute as an earthenwork in the woods on Big Island since 2003. An obvious concrete wall running north to south, situated immediately to the east of the Refreshment and Dance Pavilion, is the base of a row of Archways (A11) that may have also served as the 'wall' of the Chute; its missing arch 'scars' are obvious. The twists and turns of the water ride are evident when the woods are thinned out. MHM has contended the Mystic Chute (labeled the Old Mill Ride on the Sanborn Map) was similar to the Ye Old Mill operating at the Minnesota State Fair since 1915.[12] Ye Old Mill was constructed as a winding concrete covered 'river' - a tunnel - that small wooden boats navigated for a short ride. A rare post card - and data accumulated during the 2019 BI Project - confirmed MHM's hypothesis. During this project, MHM surface-cleaned the areas on both sides of the concrete wall and used small test trenches further to the north to confirm the continuation of the wall toward Feature T3 - and 1 Archway Base survives further toward the T3 stairs. MHM estimated the width of the concrete 'river' and a small test trench opposite of the first small trenches confirmed the hypothesis - the other side of the Chute was located. The width of the boat ride channel varied from 8.50' to 9.00' to 10.00', measured at various locations along the earthenworks and the exposed Archway Base. Further, MHM used a probe inside the Chute and after 36.00", a hard surface was reached. MHM contends the complete or nearly complete winding Chute may survive under the matrix, although root damage from large trees may have damage the structure. The Mystic Chute twists and turns are clearly seen in a 1962 aerial image. The section of the Mystic Chute near the end of the ride was raised off the ground - it resembled a roller coaster - and the boat splashed into a small pool before it turned to the east toward the off-loading area. The remnants of the small pool can be seen in 1937 and 1960 aerial images and a concrete support for this ride section is *in situ* (Mystic Chute Support). Lastly, on the west side of the Mystic Chute the remains of a small building (MC Outbuilding) were located; the foundation of the building had fallen down the earthenworks that encompass the Chute. It can be seen on the 1912 Sanborn Map. MHM 3D scanned the visible section of A11 and the Chute, and connected them to Toilet 3 (see above).

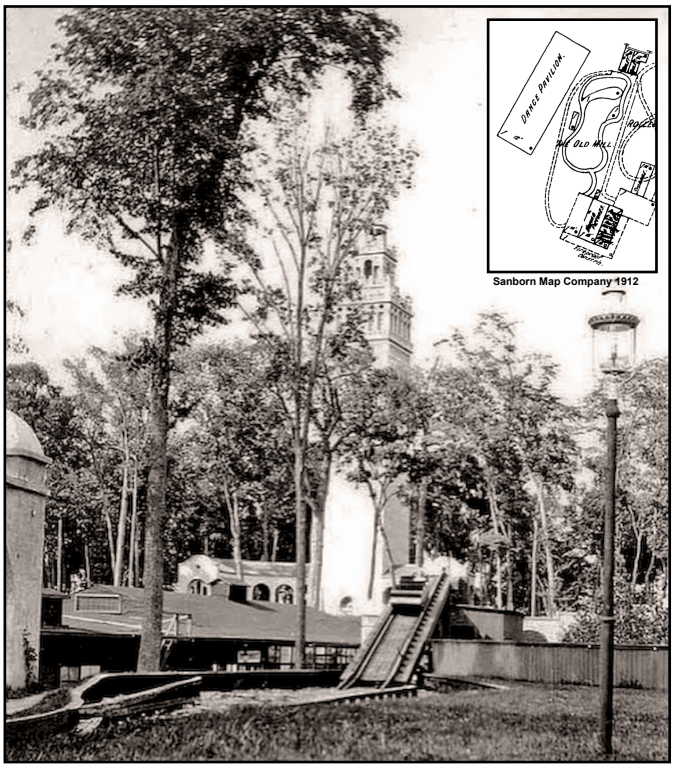


The series of Archways (A11) is seen above. Note the stepped nature of this series of arches as it traveled downhill. The Mystic Chute's winding 'roof' is labeled MC (ELMHS).

[12]It is unknown if any of the Mystic Chute's boats were purchased by the Keenan Family, the first and only owner-operators of Ye Old Mill until 2018, when the attraction was sold to the Minnesota State Fair (Nelson 2015, 2018).

Left: These Mission Revival Archways represent the west side of the Amusements Building and surround the loading/unloading area. The white building attached at the back of the building is the loading dock for the Roller Coaster (see below, MNHS MH5.9ORr2).

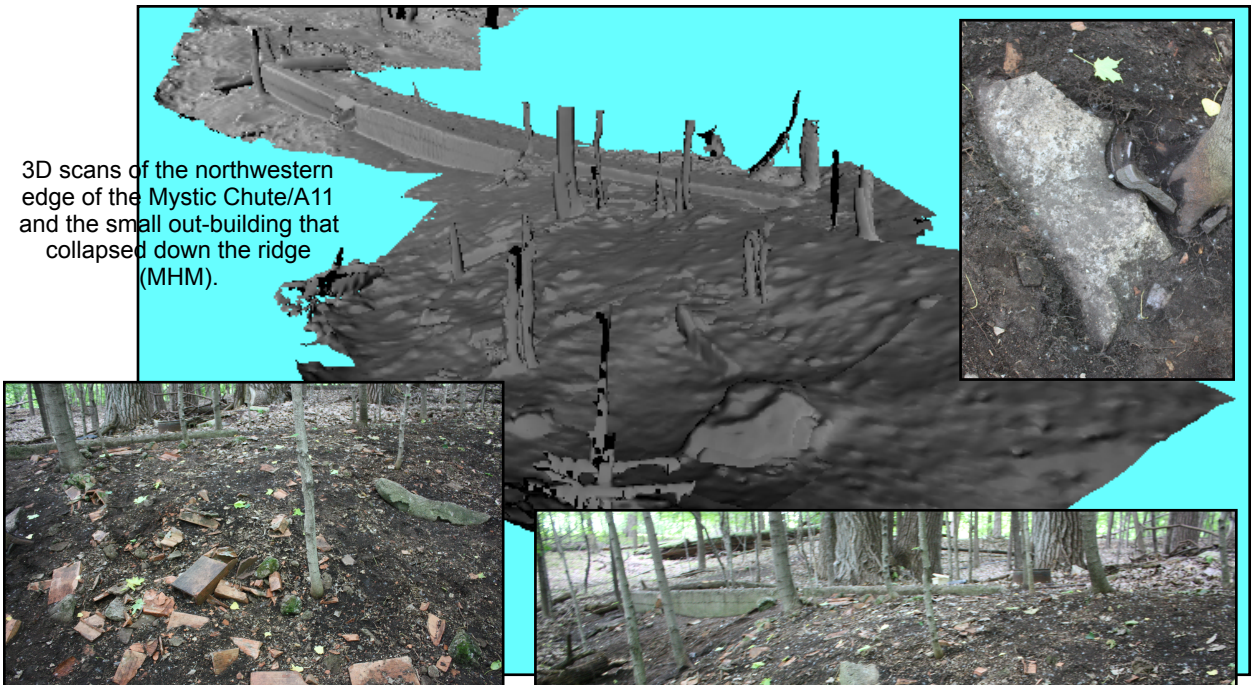
Right: The outside contour line of the Mystic Chute's roofed channel and the pool are visible in this post card image taken from the Water Tower (Darel and LaVerna Leipold).



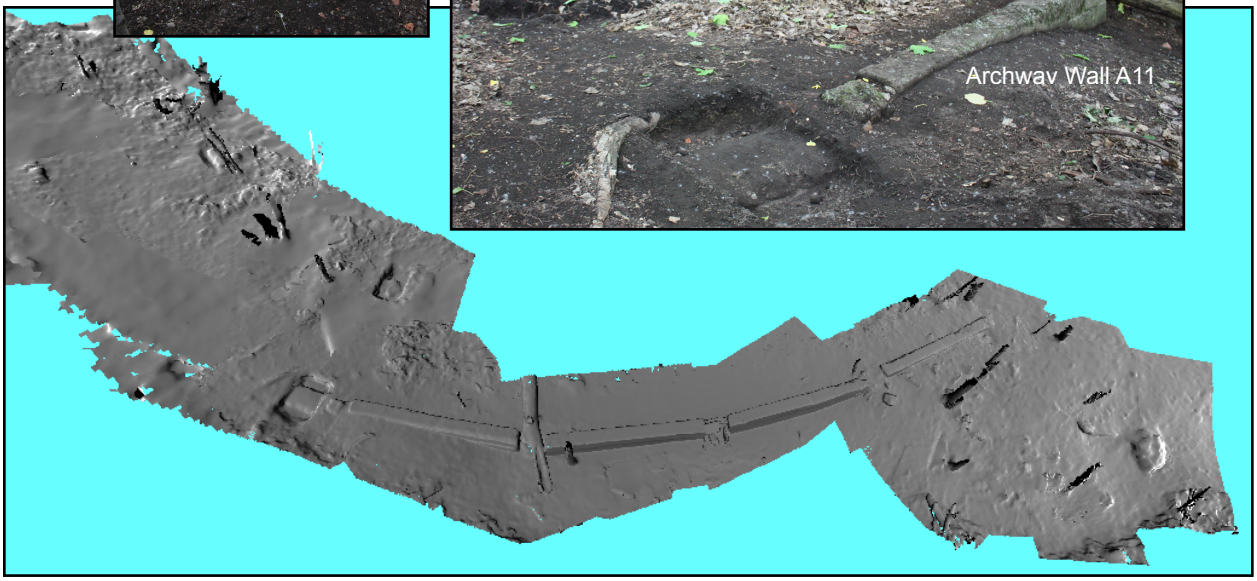
Left: The 'boat' on the Mystic Chute Ride is heading toward the pool and the last turn before it headed into the west side of the Amusements Building. The MC Outbuilding is seen under the track and the end of A11 is seen between the track and the Refreshments and Dance Pavilion (the pitched roof building to the left). The wood slatted 'barrier' seen to the right is the outside wall of the Chute's above ground 'tunnel'. The Mission Revival Archway with the small cap on top on the left of the image is the same one that is depicted in photo MNHS MH5.9ORr2 above (ELMHS).

Below Left: The green 'tunnel' is Ye Old Mill at the Minnesota State Fair; its basic design matches the Mystic Chute (MHM). Right: Ye Old Mill was established in 1915 and the aerial photograph clearly shows the above ground 'tunnel' that constitutes the ride (Ramsey County).

3D scans of the northwestern edge of the Mystic Chute/A11 and the small out-building that collapsed down the ridge (MHM).

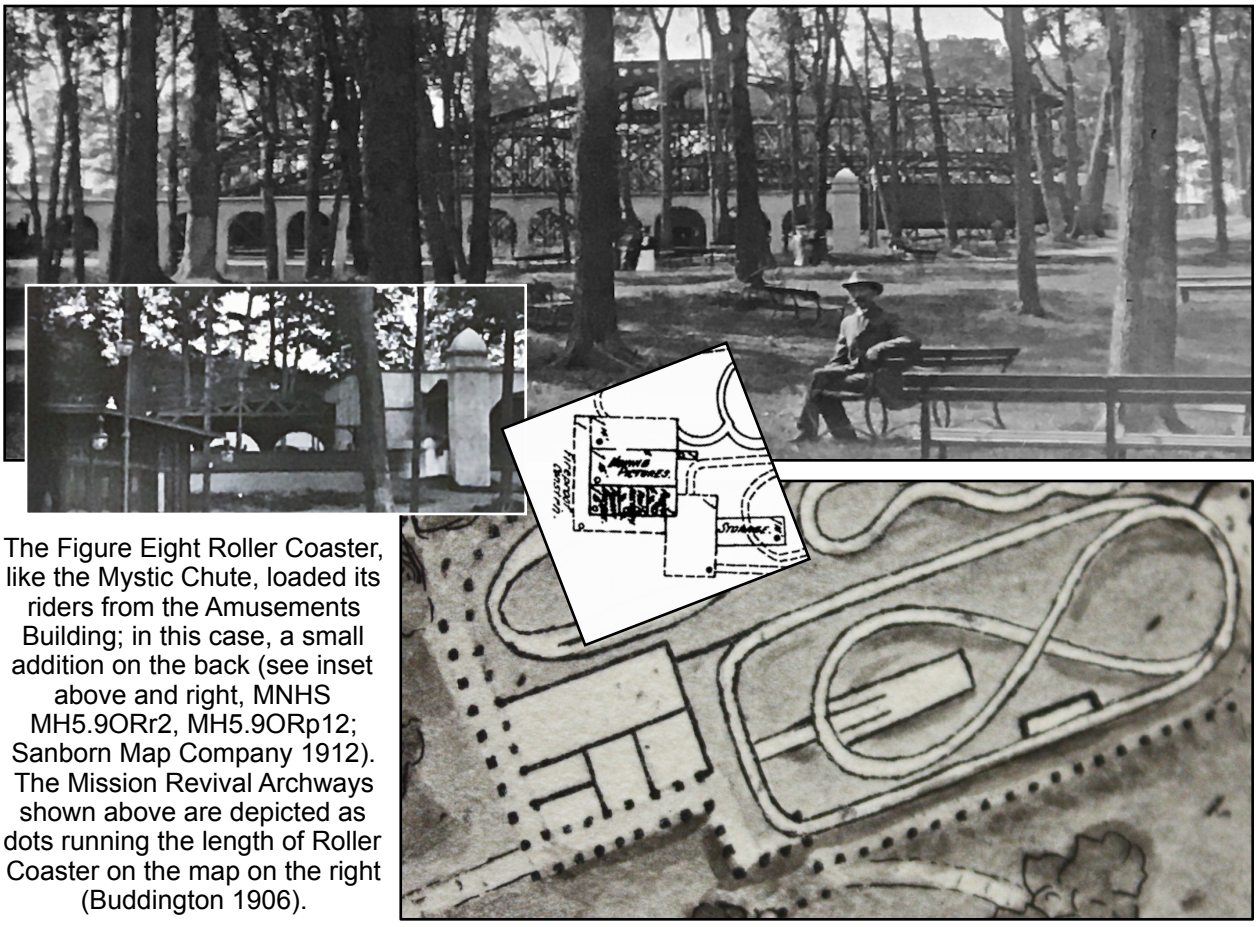


This end of Archway Wall A11 is seen in the image between the Refreshments and Dance Pavilion and the raised section of the Mystic Chute Ride.

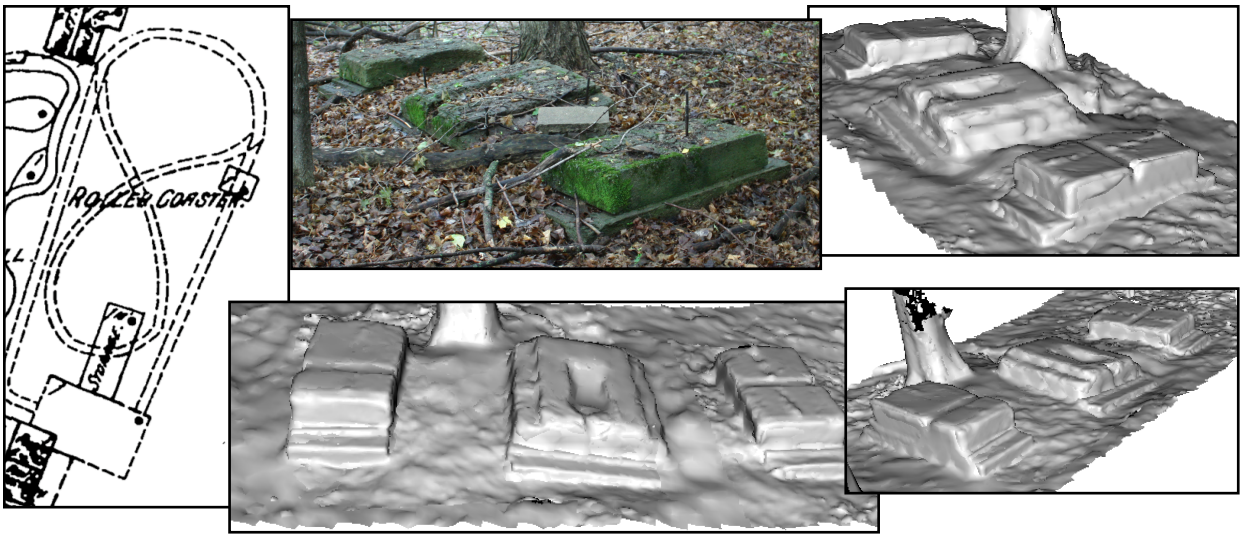


BIAP Figure Eight Roller Coaster and Mission Revival Archways: North-South

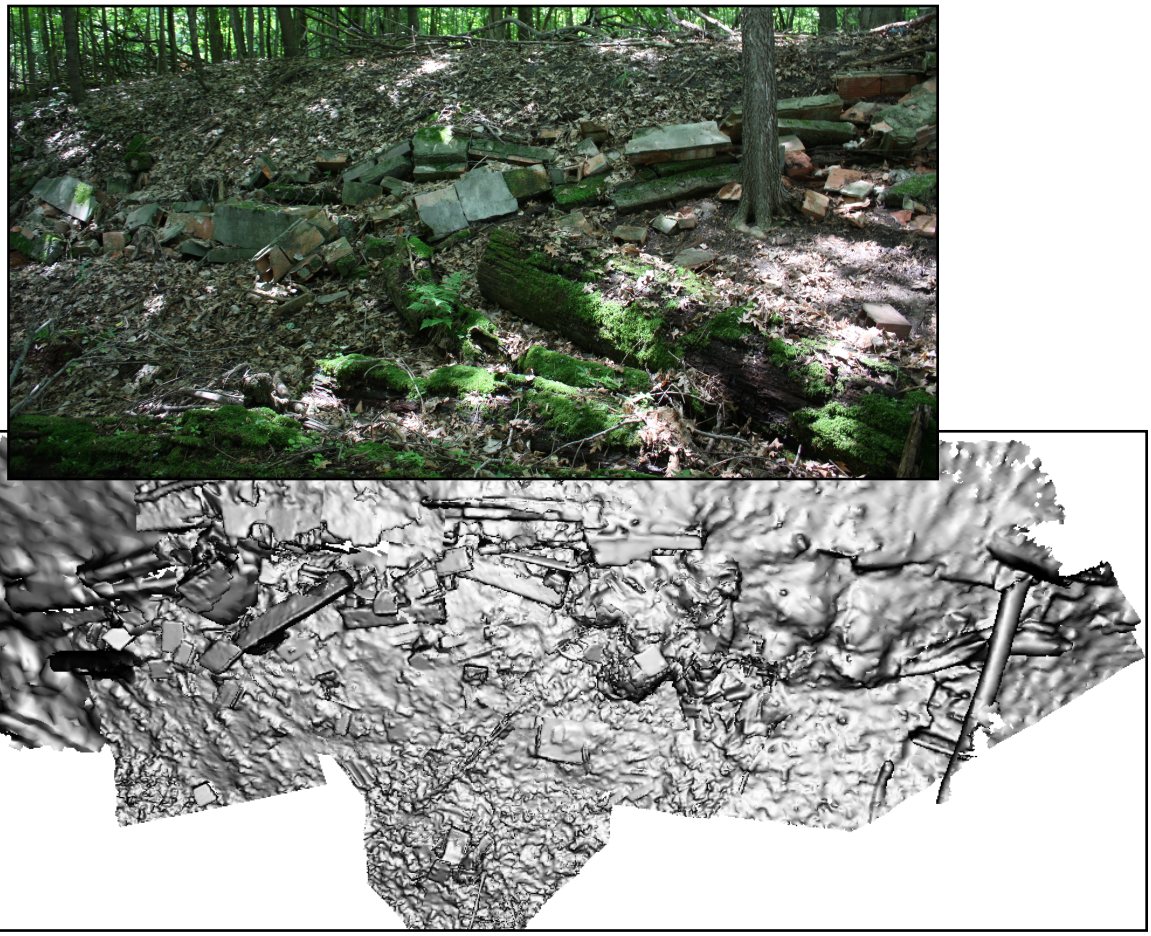
Unlike the Mystic Chute, the BIAP Figure Eight Roller Coaster had a large presence above the ground and could be seen from most sections of the Park. Constructed of wood with steel rails, its cars climbed uphill before leveling off and then speeding around the Figure Eight at 2 different levels before returning to the loading area. A rectangular building on the south end of the ride is a covered loading and unloading structure. A small terra cotta brick and concrete midden represents the northwest corner of the building (Feature RC). Of course the raised wooden ride itself is no longer extant, but a large concrete support for the ride is *in situ* (Feature RC2). Associated with the Figure Eight Roller Coaster, a row of Mission Revival Archways: North-South (Feature A7) is found to the east of the ride. This large wall of Archways was constructed with a sturdy and long base that extended down the side of a gully and it resembled a retaining wall at that point. MHM examined the wall and associated 'plinth' at its end in 2003. During the 2019-BI Project, MHM 3D scanned Feature RC2 and a portion of Feature A7. A series of plastic garbage bags full of used asphalt roofing shingles were placed at the base of the east side of Feature A7 to shore it up. The current condition of this Archways wall is helpful for archaeology because its design and construction is exposed; knowledge gained from the study of this feature can be adapted to other Archways throughout the island. When it was constructed, Feature A7 extended southward to the end of the Roller Coaster, doglegged to the east, and then continued to the south around the Amusements Building.



The Figure Eight Roller Coaster, like the Mystic Chute, loaded its riders from the Amusements Building; in this case, a small addition on the back (see inset above and right, MNHS MH5.9ORr2, MH5.9ORp12; Sanborn Map Company 1912). The Mission Revival Archways shown above are depicted as dots running the length of Roller Coaster on the map on the right (Buddington 1906).

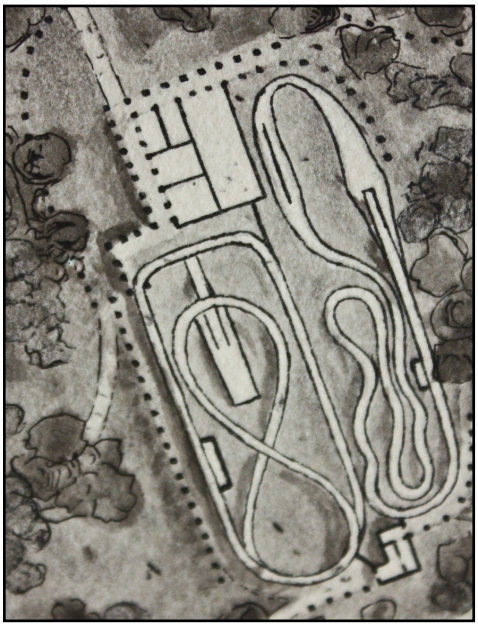


Above: The Figure Eight Roller Coaster diagram at the upper left as a rectangular support on its western side; MHM located the support in 2003, and documented/3D scanned it in 2019 (Sanborn Map Company, 1912).
Below: Feature A7, the North-South Archways, have collapsed into a gully to the west of the Roller Coaster; MHM 3D scanned some of the wall. Many parts of different Archways are extant, but currently only a toppled one is recognizable (right),



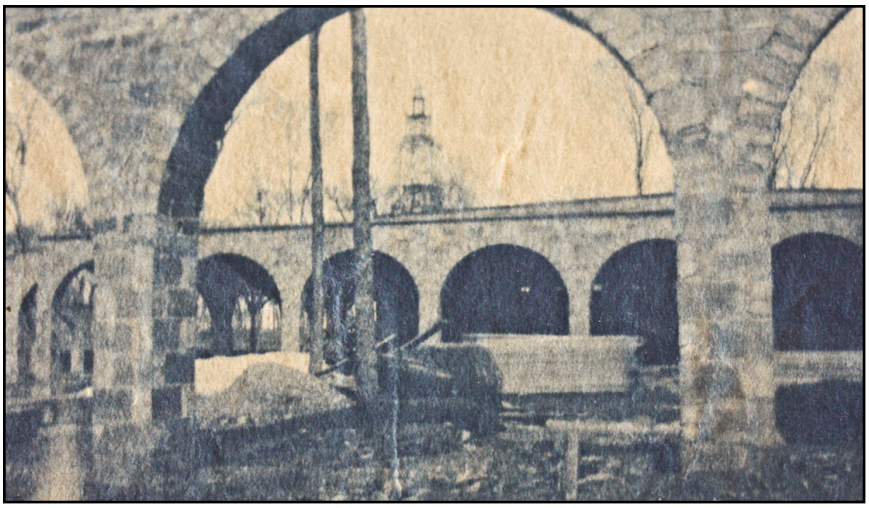
BIAP Amusements Building

The Amusements Building was designed with a Mission Revival Archway Portico on its southern end and had a clearstory roof; the building resembled the BIAP Picnic Kitchens and was constructed using terra cotta brick and concrete, and was partitioned into 5 areas was 54.50' by 78.00'. It housed a variety of entertainments such as the Fun Factory, Pennyodeon (penny arcade), Postal Photo Gallery, a Scenic Ride Through Yellowstone Park (moving pictures), and a variety of entertainments over the life of the Park (Olson 1976, 202-204; Sanborn Map Company 1912; Warnock 1908, 108). The western portion of the building served as the loading area for the Mystic Chute Ride. Archaeological data for the area is mostly represented by infrastructure (see below) except for a Mystic Chute Support at the southwest corner of the Amusements Building. The building itself was evident for decades after the BIAP closed; it appeared to be standing in 1937 and 1940, it is a ruin in 1956, and it appears to be gone by May 1960 (John R. Borchert Map Library, 1956). The Archway Wall (Feature A7) curved around the Amusements Building and continued westward toward the Steamboat Pier and Landing, joining the Mission Revival East Gazebo Bases - including Features ABE 1-5 examined by the Orono kids and MHM in 2007. Further, based on photographic evidence, a row of Archways extended from the southwest corner of the Amusements Building and extended westward 'in front' of and curving around to the northwest of the Mystic Chute. During the 2019-BI Project, MHM 3D scanned the Mystic Chute Support as it was integral to the stability of the western portion of the Amusements Building, but was hidden from view while the Park was open.



Above: The Amusements Building is the flat-roofed building at the 'top' of the image. Feature A7 - seen at the right side of the image - is the same structure discussed above in relation to the Figure Eight Roller Coaster. The Archways took a dog-leg and continued southward, curved around the Amusements Building and continued to the East Gazebo at the Landing. The loading/unloading building for the Roller Coaster can be seen attached to the north side of the Amusements Building, and the Mystic Chute's loading and unloading area is inside the west side addition to the building. The Amusements Building's Archway design allowed it to obscure some of the 'inner workings' of the rides. The above image is also helpful since it also depicts part of the roof of the Restaurant and Dance Pavilion, and it associates these major buildings and constructions with each other visually (Darel and LaVerna Leipold).

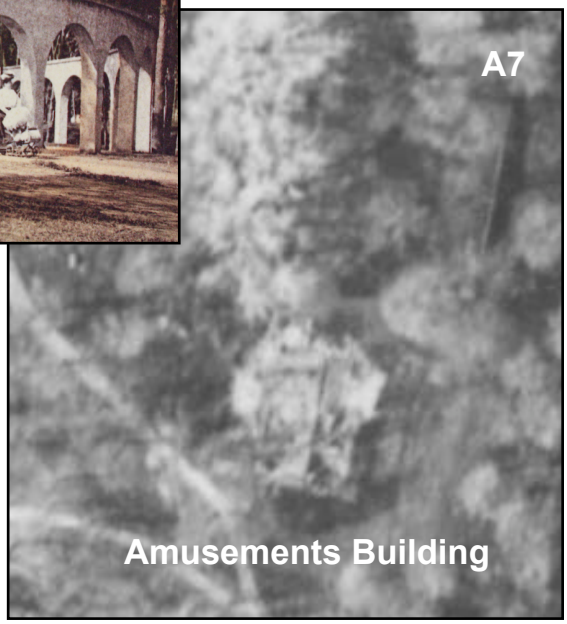
Left: A Buddington plan of the Amusement Rides area that supports the above image. While the plan is not entirely accurate, in consideration of many attributes, it is useful (Buddington 1906).



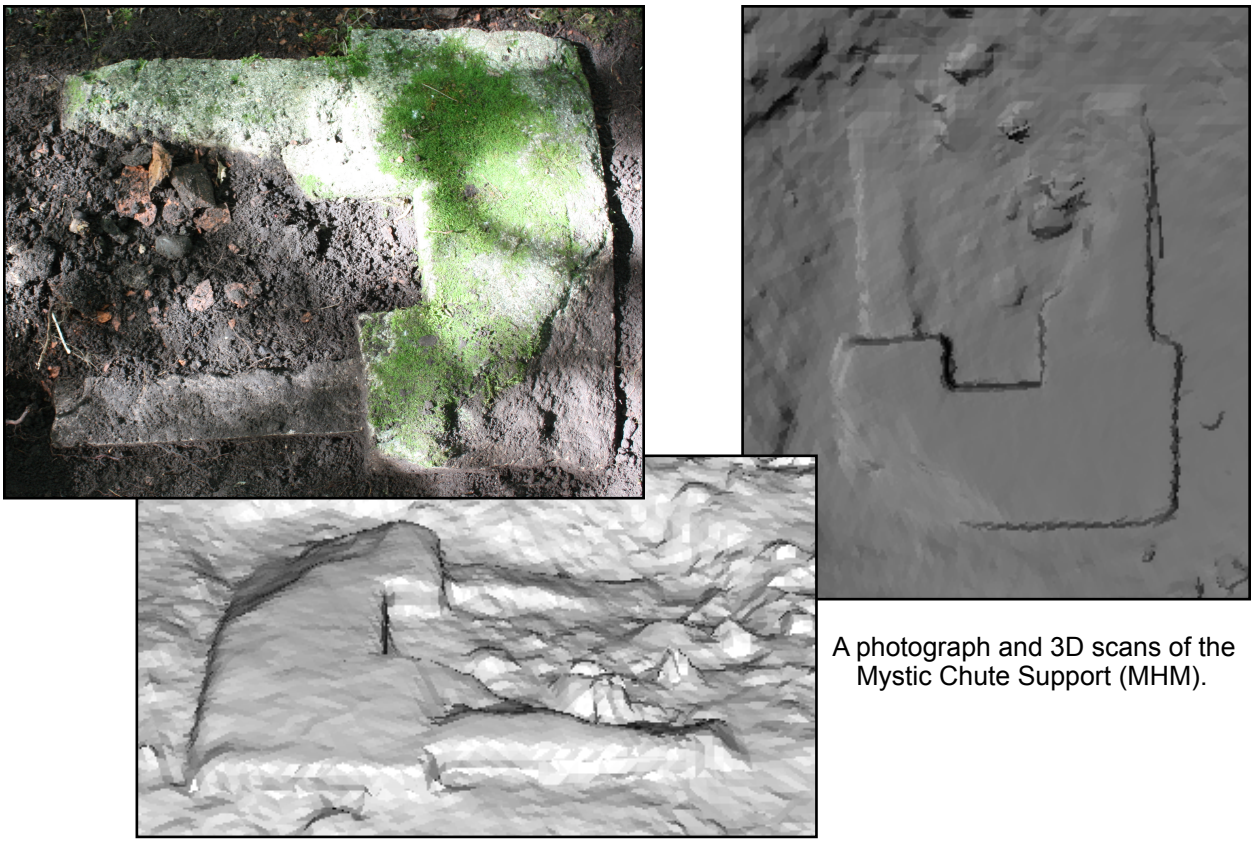
Left: The Amusements Building is the structure with the arched portico on the far side of Feature A7. Feature 7 is in the foreground and still under construction, like the Water Tower in the distance.

Below: Feature A7 as it curved around the Amusements Building and joined the East Gazebo at the Landing (Buffington 1906).

Above: Another view of Feature A7 as it curved around the Amusements Building; note the scaffolding around the unfinished Water Tower (ELMHS).



Right: The ruin of the Amusements Building in 1956 (John R. Borchert Map Library, 1956).



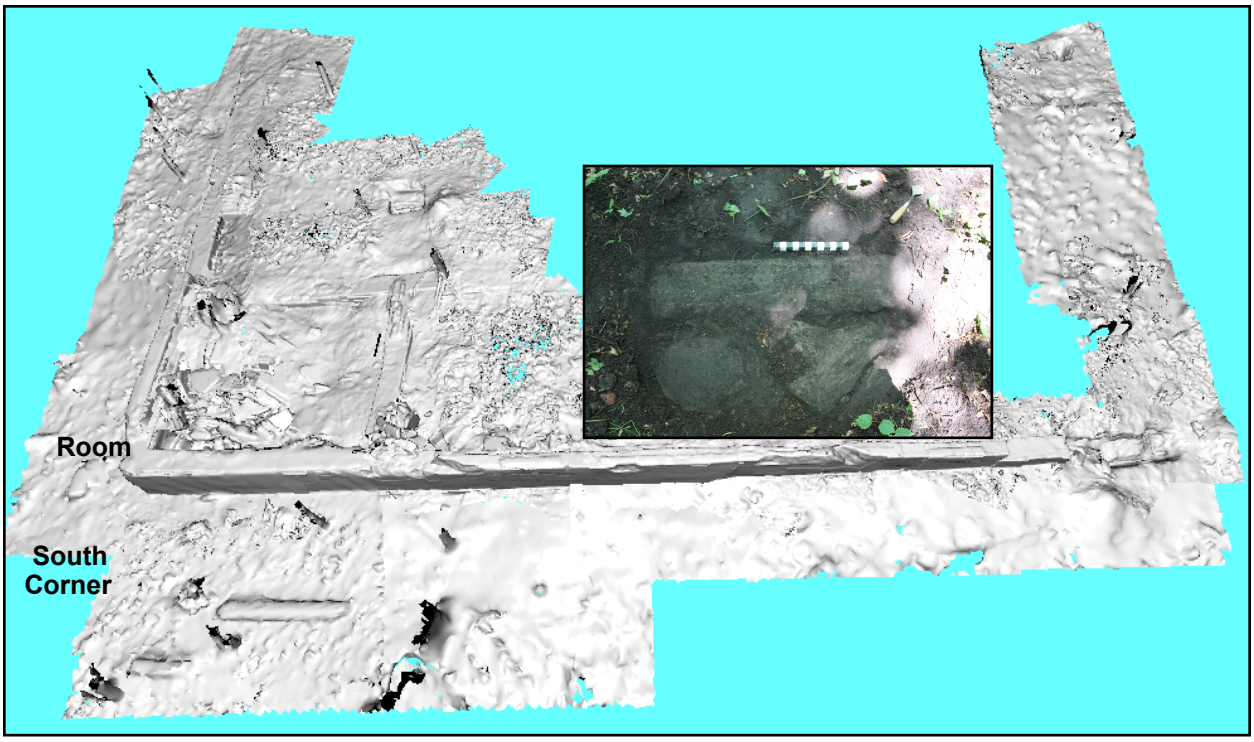
A photograph and 3D scans of the Mystic Chute Support (MHM).

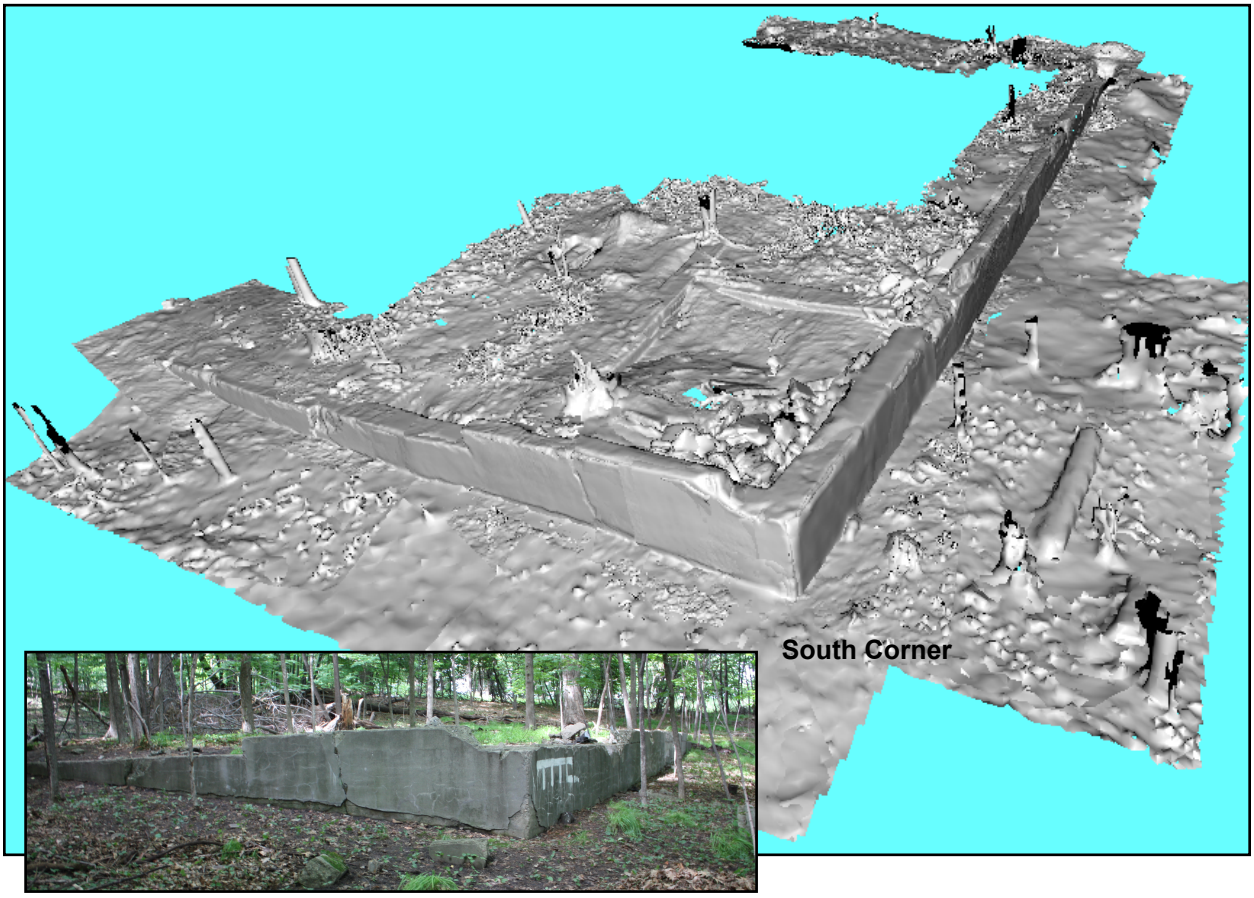
This complete view from the Water Tower pulls together the associations between the buildings, Archways, Gazebo, Landing, and Lake Minnetonka itself. This image is crucial to MHM's understanding of a substantial portion of the project area (Darel and LaVerna Leipold).

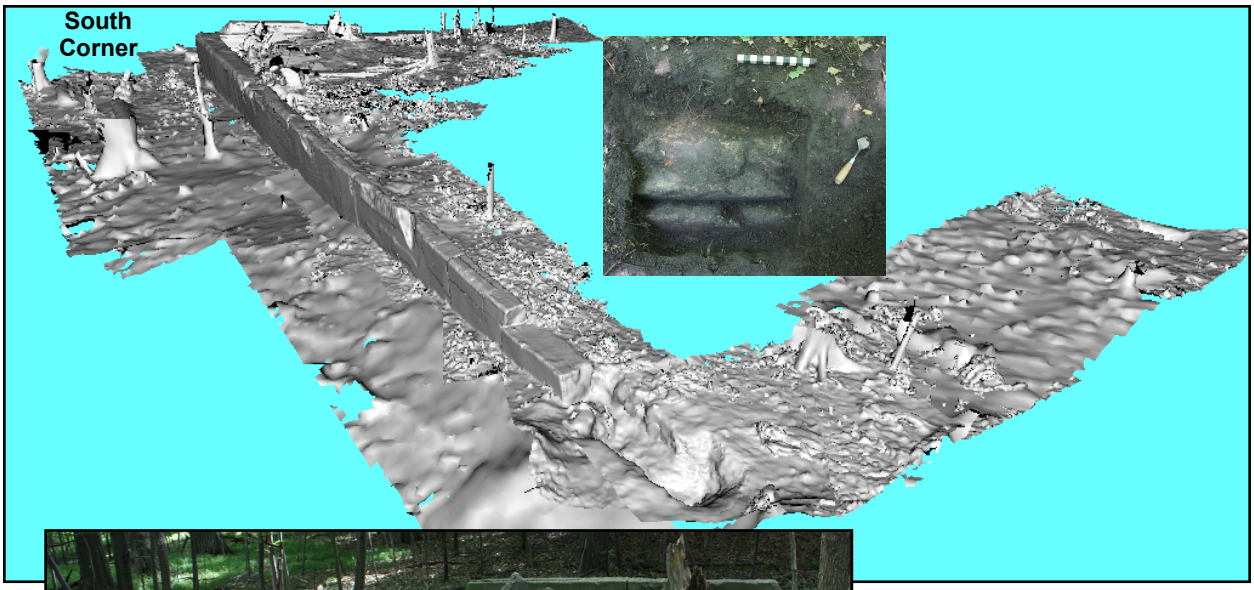
BIAP Women's Dormitory

After the Steamboat Landing, Stairs, and Mission Revival Gazebo Bases that greet visitors to Big Island, the most substantial and obvious archaeological feature on 21-HE-402 is the BIAP Women's Dormitory. Feature WDorm is located to the east of the Amusements Building and to the southeast of the Toilet 2 (Feature T2), behind a rise on a lower section of the island. The feature is rectangular, measures 54.50' by 28.30', the building had 2 stories, and was built with terra cotta brick and metal reinforced concrete. The thickness of the walls clearly indicates they were designed and constructed to support a heady load. The southeastern face - that retains some of its stucco surface - of the building's foundation rises over 4.00' above the ground surface at the south corner (graffiti can be seen there); it is at ground level at the east corner due to a rise in elevation. MHM conducted surface cleaning and small shovel tests to expose certain interior attributes and clear away exterior debris. Feature WDorm has a central corridor extending the length of the building, with small walled-off rooms on either side of the hallway. The south corner room has been filled with parts of the demolished building in the form of broken concrete and metal. In other parts, the interior, concrete floor was uncovered through surface cleaning, very near the ground surface. The entryway for the building was located at the southwestern corner of the feature, facing the activities and other structures on the island; this placement is sensible. Apparently the Game Farm and BIVC did not use the BIAP Women's Dormitory after the Park closed. Early aerial photographs do not provide clear images of Feature WDorm, primarily due to tree growth. By 1956 the trees had thinned out showing the building as a ruin . Later images show the feature as an indistinct blob, sometimes covered in snow. However, the Women's Dormitory clearly appears in aerial images as a ruin, but with sections of walls still standing in 1967. MHM 3D scanned periphery and some inner attributes of the BIAP Women's Dormitory during the 2019-BI Project.

This obscured view of the Women's Dormitory is the only confirmed image of the building MHM could locate beyond some aerial views. Note the exposed terra cotta brickwork, an indication that either the building was still under construction (before 1906) or it had been abandoned (after 1912, EB05684, Edward A. Bromley Collection).


Room
South
Corner

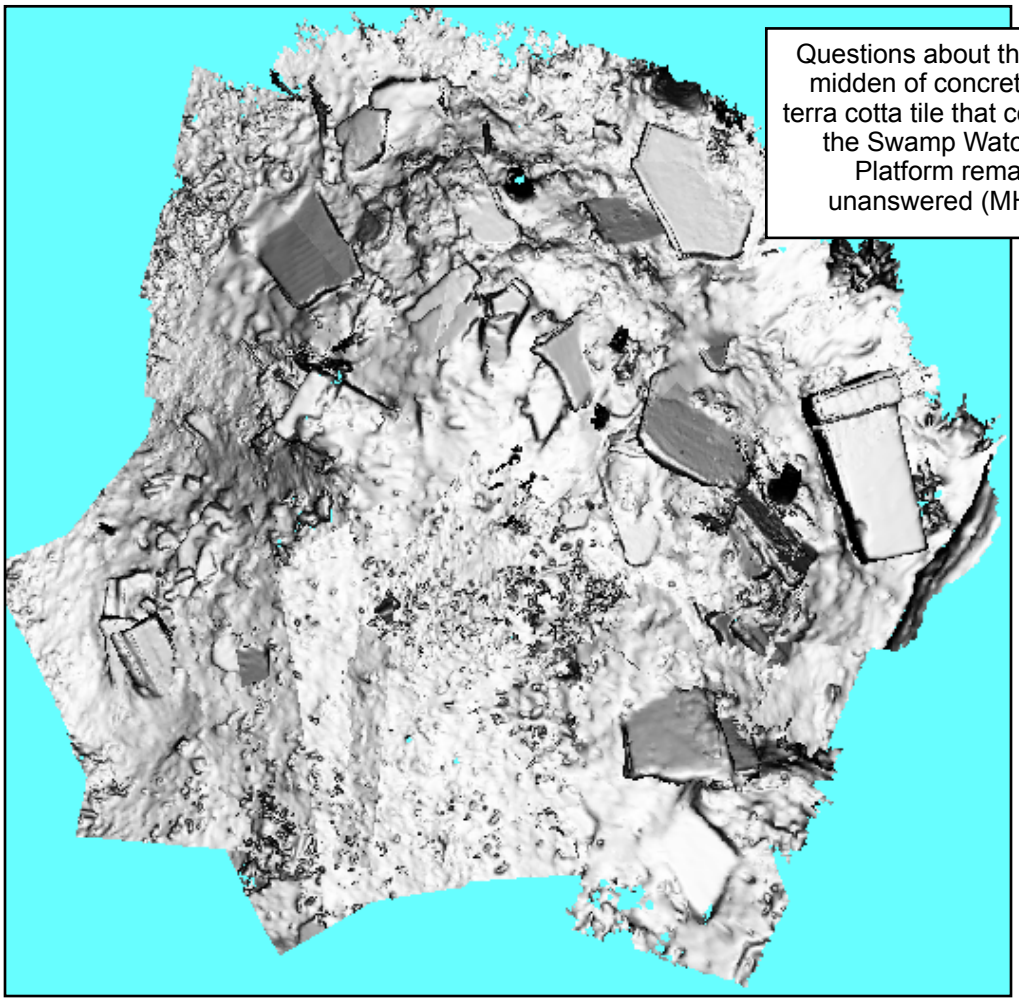

South Corner


South
Corner

South
Corner

BIAP Swamp Watching Platform

Another obvious collection of concrete and terra cotta brick feature on Big Island is located on the lowest point on the island near the largest pond - the BIAP Swamp Watching Platform. MHM gave this feature a whimsical name because the purpose of this large toppled structure is completely unknown and yet, it was not dumped at its current location; most of it is *in situ*. Further, the area was lighted by tall lamps, indicating island visitors were encouraged to visit the Swamp in the evening. No aerial images of the area provide details of the feature. MHM 3D scanned the Swamp Watching Platform; it is hoped its purpose can be ascertained in the future.



Questions about the large midden of concrete and terra cotta tile that comprise the Swamp Watching Platform remain unanswered (MHM).

BIAP Music Casino

When BIAP first opened in 1906 and then more fully in 1907, visually the Water Tower obviously drew people to the island. It could be seen for miles during the day and particularly at night, with thousands of lights illuminating it and the Park. Once on the island, the Music Casino demanded the attention of most visitors as they headed to the east. According to the building's blueprints, the Music Casino measured 125.20' by 147.70' and was constructed of terra cotta brick and concrete. The building had a Mission Revival Archway Portico on all 4 sides[13]; the middle sections of the east and west porticoes jutted out from the building, creating a 'porch' of sorts on the west side. The Music Casino's roof was covered with red half round clay ridge tile, and gravel was spread onto the roofs of the porticoes. The building's round peak had a large skylight supported by steel beams. Due to the weight of the roof, columns with iron cores were placed roughly in a circle surrounding the audience area. Four additional iron columns were used at the east side of the building, where the stage was located, to strengthen that heavily used area[14]. These 4 iron supports also held up the interior portion of the east end portico. The building was constructed on the slope of a hill and this situation allowed for the incorporation of a 'basement' into the building that performers used before and after their time on stage. The Music Casino had 8.00' tall walls on its eastern side, along with flights of stairs. The main level was open and airy, providing cool breezes during performances that could accommodate 1,500 people. The TCRT boasted about the caliber of the talent that performed in the Casino including 'Innes and His Great Band', 'Banda Rossa', 'Navassar Ladies' Band', and 'Nelson and His Band with Twin City Vocalists' (Warnock 1908, 108).

Above: The Music Casino's south side is facing the camera; its west side has one of the the Archway 'porches' protruding from its portico (MNHS).

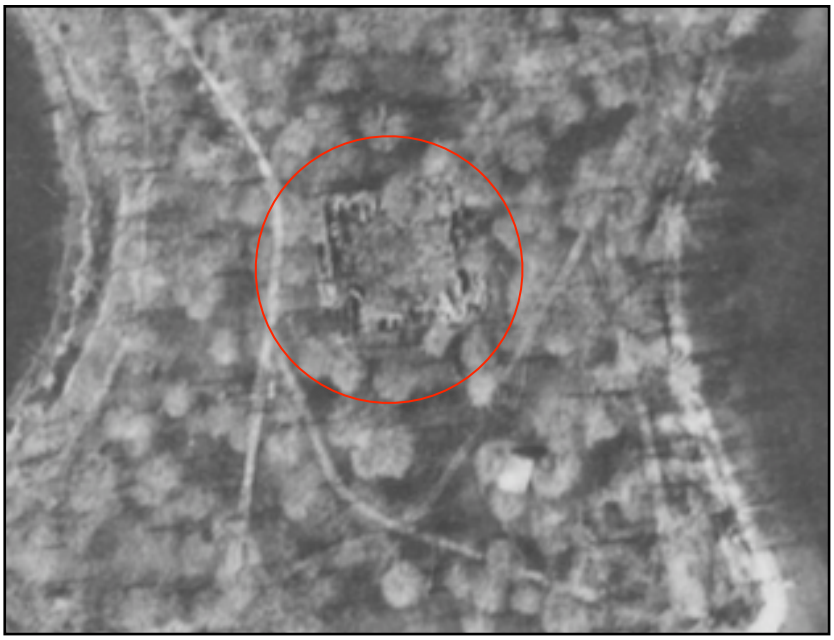
Left: The interior auditorium area of the Music Hall (Womack 1908, 108).

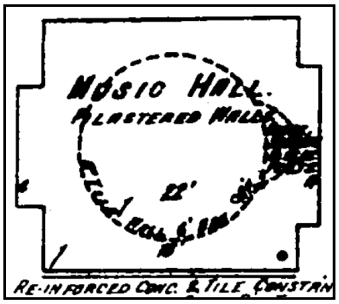
Right: The Music Hall's skylight and light through its Mission Revival Archway Portico (Buffington 1906).

[13]The Archways of the Music Casino supported the building's roof and there are steel columns to secure the heavy glass and steel skylight. Images of the BIAP Music Casino depict angles of the building from the west, south, and east - none from the north. However, the blueprints for the building clearly indicate that a Mission Revival Archway was present on that side of the building as well.

[14]The Music Casino hosted large bands and orchestras; the weight of the people and their instruments required additional support on the west end of the building.

The Music Casino and the Pergola (see below) taken from the northwest (ELMHS).





The Music Casino was a substantial ruin in 1956. Its shape is clearly seen in the aerial image when compared to its depiction in the Sanborn Map (John R. Borchert Map Library 1956; Sanborn Map Company 1912).

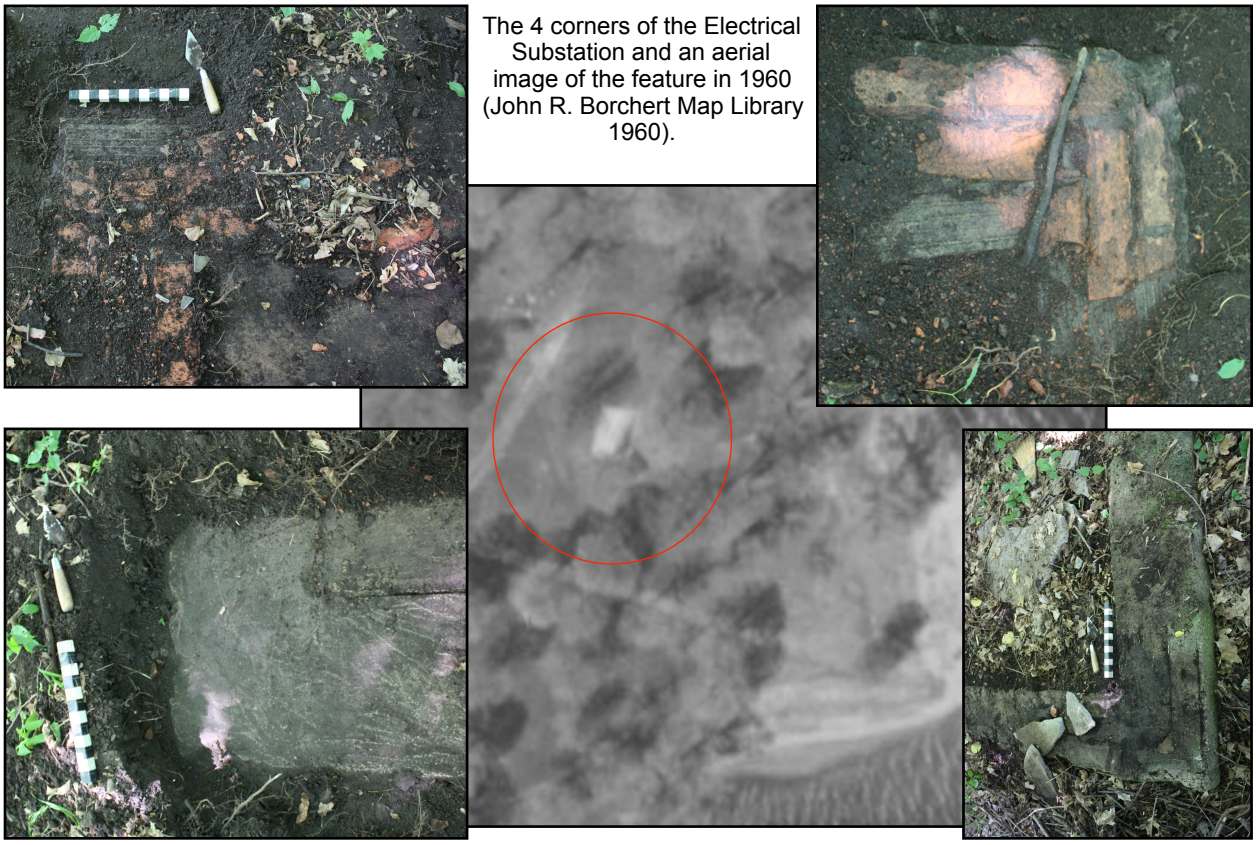
Initially, it was difficult to ascertain - archaeologically - where the Music Casino once stood, regardless of its large size. Studying aerial photographs allowed MHM to narrow down its precise location. While early images from 1937 depicted the Music Casino, the photographs lacked detail. To contrast, photographs taken on 7 May 1956 clearly show the ruins of the building, including Archways, porticoes, and the round auditorium. The next year the feature was evident in aerial photographs but with no detail, and by 1960, all Music Casino remains were entirely destroyed or buried. MHM began surface

cleaning an area where the west portico should be found - and its foundation was easily located less than an inch below the surface. Following the east portico foundation in both directions, MHM found that the Sanborn Map and Buffington's blueprints are accurate in the Music Casino's depiction. A series of small test trenches and simple surface cleaning in some areas allowed MHM to uncover the entire west portico, the remaining section of the west wall, and its turn to the east. The corner junction of the west and south walls is intact, as is most of the Archway wall foundation. MHM did not uncover the corner junction of the west and north walls or north and east walls, because of the great depth of the matrix in those areas. Further, the archaeological questions concerning the Music Casino were answered without deep test trenches or shovel tests. MHM 3D scanned the investigated areas, providing a good basis for future research should further investigation be warranted. See the appendix for larger versions of the 3D scanned Music Casino features.

MHM uploaded the 3D scans of the Music Casino to test how accurate the system can be when dealing with a large feature. MHM is impressed with the output of the system. Note that the south wall does not follow the original, but it is accurate. Archaeological features do not always - actually, they usually do not - match a blueprint. Features shift, are moved around, are looted, are accidentally or intentionally destroyed - just about anything can happen to them (Sanborn Map Company 1912).

BIAP Electrical Substation

To the southeast of the Music Hall, the BIAP Electrical Substation's rectangular foundation wall survives *in situ.* Further, through probing, MHM has determined much of the poured concrete floor is intact under the shallow matrix. The Electrical Substation is 28.00' by 34.00' in size and remnants of the walls indicate the building was constructed of terra cotta brick reinforced with concrete and adhered to each other with mortar. The Substation was vital for the operation of the BIAP's electrical equipment. The Electrical Substation housed transformers that would reduce the voltage the system received - 13,500 volts - to an appropriate level for the electrical systems on the island. Throughout BIAP, thousands of electric lights were strung through the trees, tall lamps were wired for light along walkways and outside buildings, and the Water Tower would light up in the darkness to be seen for several miles the: "wonderful pleasure resort will be brilliantly lighted with powerful electric lights. Night will be as bright as day". Further, part of the BIAP infrastructure included 700 and 800 HP electrical motors that were also served by the transformers in the Electrical Substation. The building received the system voltage through an underwater cable laid down to the island from Ferguson's Point and Deephaven to Hopkins and into Minneapolis. The generating station owned and operated by the TCRT in the city sent the current overland using power poles (*Minneapolis Journal* 1906). Aerial photographic evidence is helpful in determining when the BIAP Electrical Substation was no longer extant; an image from May 1960 clearly depicts the feature with a collapsed roof. By November 1967, the building's damaged walls still stood, and the main roof beam was in place; the remainder of the roof was gone. By November 1971, the rectangular foundation was protruding above the ground enough to be visible using aerial photography, but it was mostly destroyed (John R.Belchert Map Library1960).



The 4 corners of the Electrical Substation and an aerial image of the feature in 1960 (John R. Borchert Map Library 1960).

BIAP Band Stand

The BIAP Band Stand was a 1.5 story open wooden structure that measured 15.00' by 15.00'. MHM is not aware of any photographic images of the Band Stand, but it was depicted in BIAP promotional materials[15]. MHM located a small bit of physical evidence of the Band Stand in the form of an *in situ* concrete foundation with embedded metal pipe that may have been a conduit for electrical wires. Further, the Cabin Steps Midden may be related to the Band Stand (see below).

BIVC Point Charming Cabins 20-29, Toilet, and Pavilion

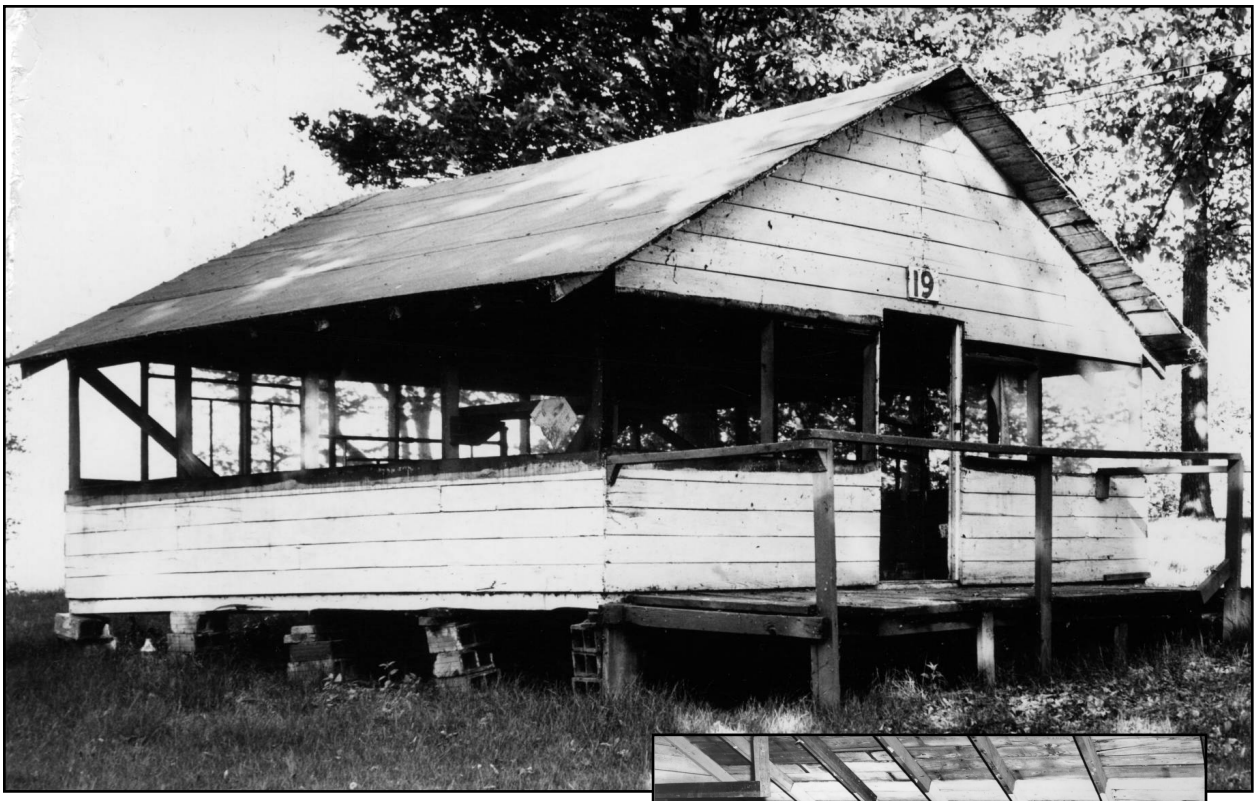
During the years that Big Island was used by the BIAP, little physical evidence *in situ* on Point Charming has been identified to date, beyond some infrastructure (see below). During the BIVC years, Point Charming was home to at least 10 Cabins identified in aerial photographs, although 1 of these structures may be a toilet building. MHM has numbered the Cabins 20-29; these numbers do not reflect the actual designations given to the structures by the BIAP. A combination of BIAP concrete slabs and BIVC cinder blocks embedded in concrete - the Cabin Steps Midden -have been moved and dumped into a pile to the northeast of the Band Stand. This combined midden possibly represents a platform or steps for the Band Stand that were then re-used as steps for BIVC Cabins. The presence of BIVC cinder blocks in concrete indicate that at least 1 'Tent Cabin' was located in the area, up on block 'stilts'. Recently, 2 other buildings were used by the BIVC visitors, a Toilet building (Feature T5) and a BIVC Pavilion that was

[15]The promotional maps and graphics prepared for the BIAP by Buffington are very useful for analyzing some features, they are not completely accurate when depicting the final look of the Park.

used as a shelter; the Pavilion has a small concrete 'patio' that still exists *in situ*. MHM utilized these structures during the 2007 BISI project. The Toilet building might be the same feature as C24 - so what MHM has labeled as a 'cabin' may not be a dwelling, but a toilet building. It seems Feature T5 was torn down in 2009 and the Pavilion burned down in 2010-2011.

Insets: The BIVC Toilet in 2007; note a corner of the Pavilion on the left (MHM). Above: Five BIVC Cabins on Point Charming; the structure furthest to the right is Cabin E (WHS).

Below: Veterans using 'Cabin Tent' 19 around 1930 (MNHS U3.3r1).



Above: Formerly Cabin Tent 19, Cabin 19 was roofed at some point; note the 'stilt' stacks of BIAP terra cotta hollow bricks and cinder block combination. Hollow bricks can be seen in the previous image, next to the man with the umbrella (HCL P0726).
Veterans at 'Cabin Tent' 19 around 1930 (MNHS U3.3r1).

Right: A bed in Cabin 19 (HCL P0726).

Below: The Cabin Steps Midden (MHM).

BIAP Pergola

Another icon of the BIAP was the 14-columned Pergola with a wooden trellis that led island visitors to the Music Casino. The Pergola survived for decades into the BIVC years, and can be seen in an aerial photograph from May 1956 (John R. Belchert Map Library 1956). The Pergola Feature was destroyed sometime in the late 1950s-early 1960s. During the 2019-BI Project, MHM located and identified 6 of the 14 column bases. The Pergola's columns were round with square bases, and they were constructed of terra cotta bricks, concrete, mortar, and they were smoothed with stucco. MHM 3D scanned the feature.

The Pergola (WHS)

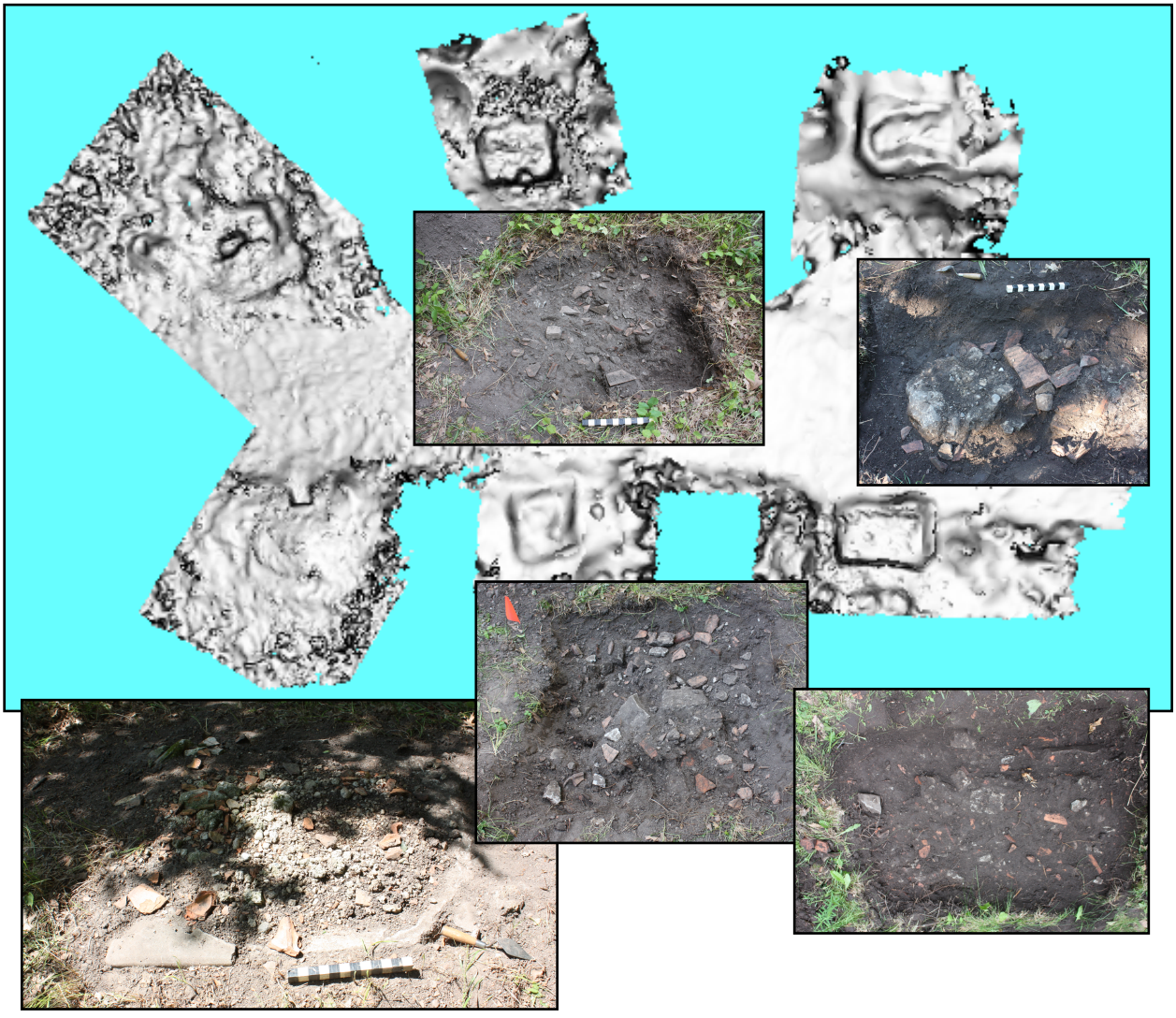
The Pergola (ELMHS)

The Pergola in 1956 (John R. Borchert Map Library 1956).

The Pergola (ELMHS)

A modern pipe obliterated this pergola base.

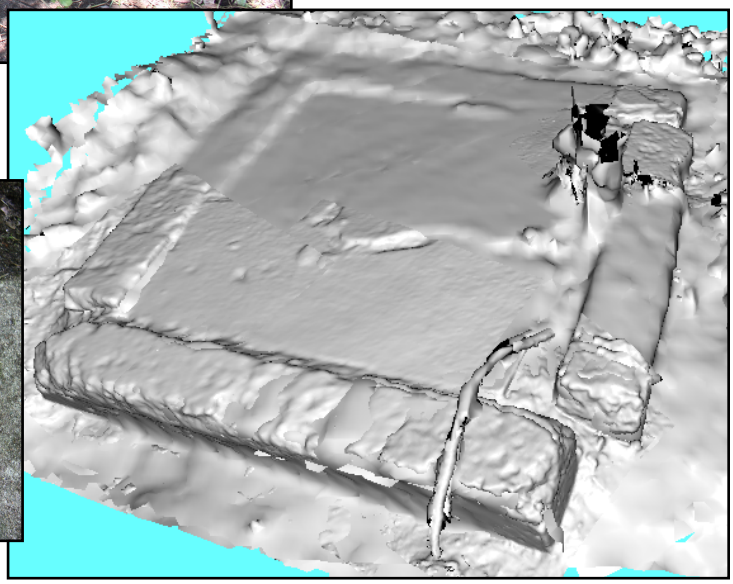
MHM's 3D scans and photographs of the Pergola.



BIAP Pump House

MHM located the BIAP Pump House near the shoreline. Surface cleaning revealed the intact - but cracked - concrete foundation and floor. Remnants of the terra cotta bricks that comprised the walls can be seen in the concrete and sherds of the bricks are scattered around foundation. A metal pipe for taking water out of the lake to be used on the island protrude from the south side of the foundation. Other pipes protrude from the concrete floor that would direct the water to the proper location in the BIAP. Originally the building measured 8.00' square, but tree roots have shifted the feature and its current size is 8.30' by 8.50'. MHM 3D scanned the Pump House remains.

The Pump House (ELMHS)



BIAP Path

A BIAP Path made of concrete leads visitors eastward toward the attractions on Amusement Boulevard. The pavement survives but is cracked and worn.

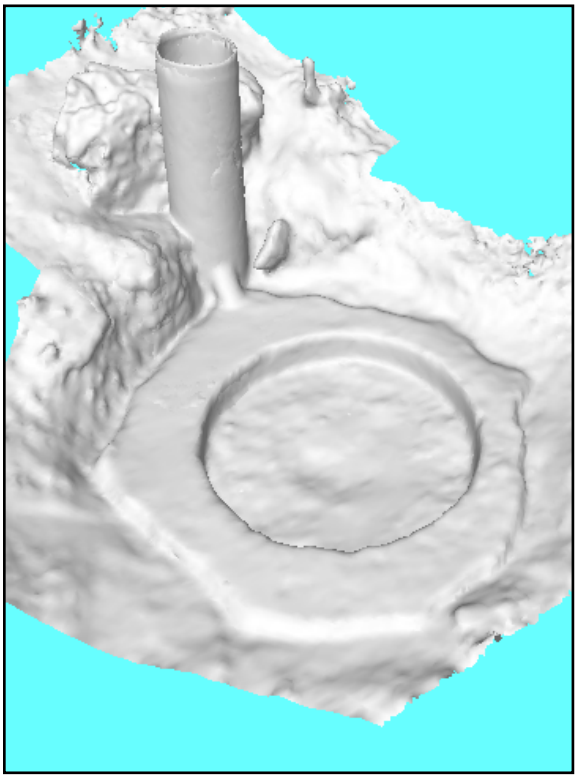
Infrastructure

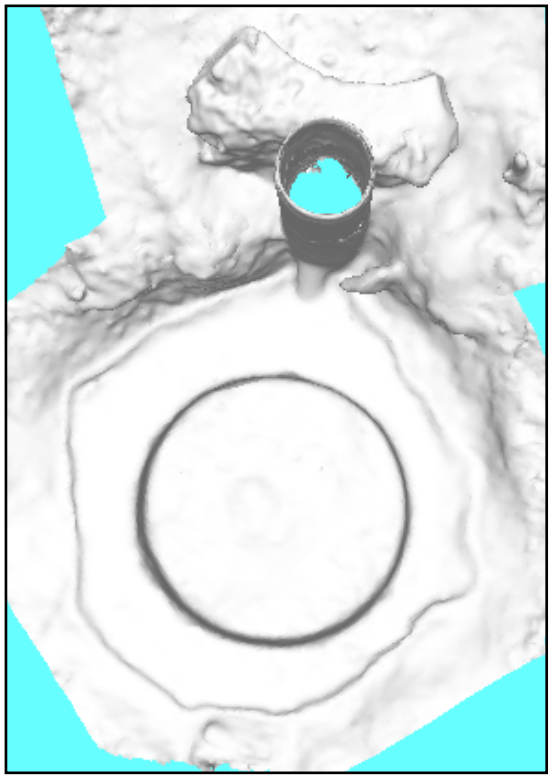
When the TCRT began the construction of the BIAP, the project area was stripped of its foliage and a deep layer of soil to install an abundance of infrastructure, including conduits for the electrical lines to power lights, kitchen equipment, boilers, and the like. Further, clay and metal water pipes were laid to move water out of the lake, into the lake, to provide potable water for park visitors, and to keep the toilet, shower, and washing facilities supplied. MHM identified archaeological features during the 2019-BI Project that represent both power and water management.

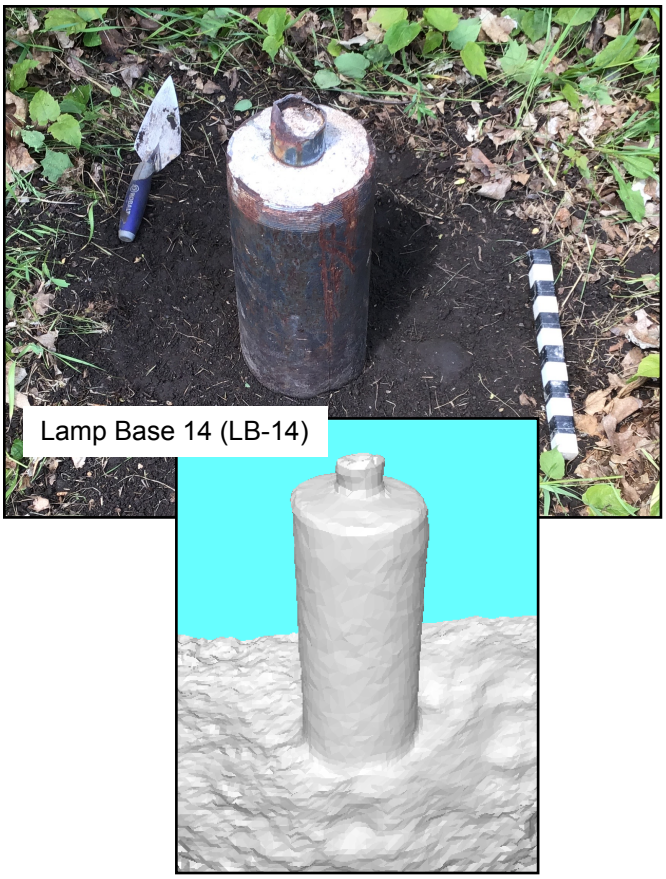
BIAP Electrical Lighting: Lamp Bases

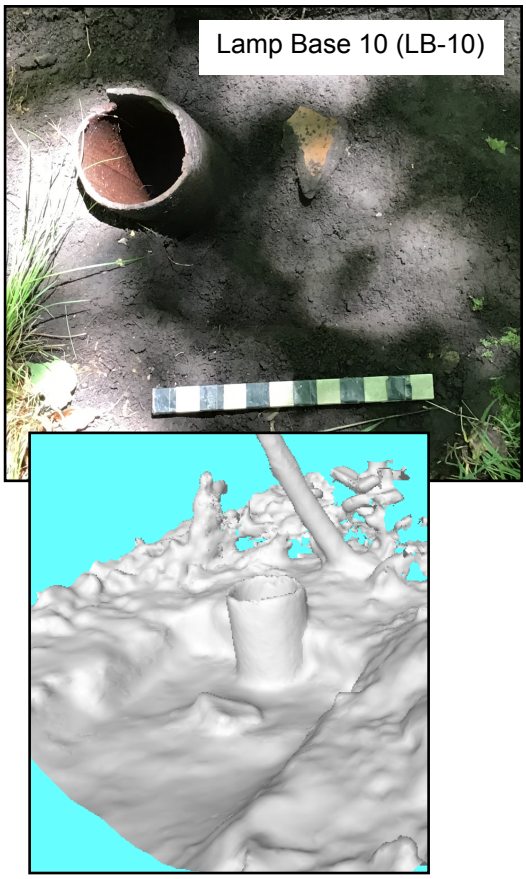
As shown in postcards and photographs, the BIAP was lit with thousands of lights, along with the Water Tower light. Some of the lights around the island were in the form of tall Lamp Posts and remnants of many of them survive around the project area. MHM located 35 Lamp Bases during the 2019 survey; some of them were filled with concrete and a metal pole by the BIVC and used as bases for camp grills. The Lamp Bases are in varying states of preservation and many are mostly buried in the matrix. MHM surface cleaned around LB10 (simple base), LB14 (re-used BIAP lamp base transformed into a BIVC grill base), LB23 (complete base), and 3D scanned those features as examples of the types of Lamp Bases still *in situ* in the project area. MHM is positive that more Lamp Bases survive undiscovered, particularly in The Mall area.

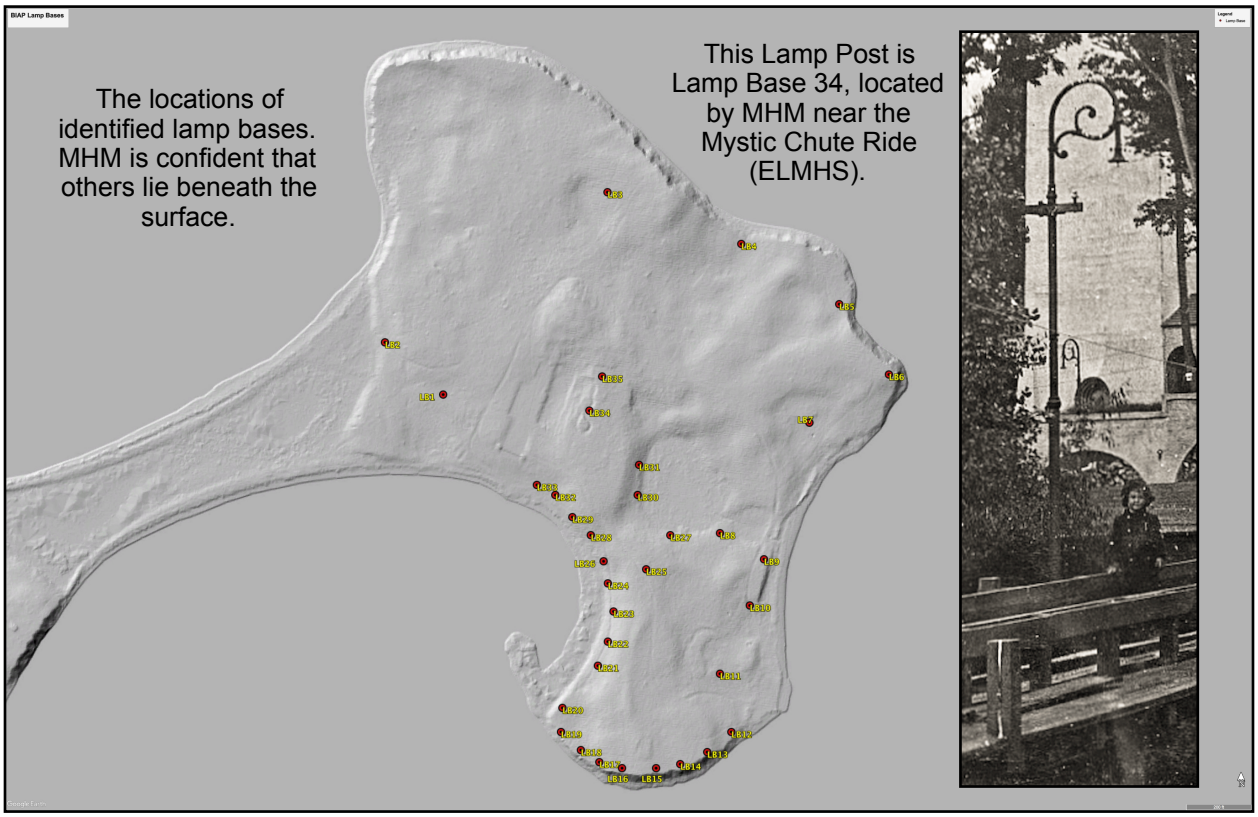
Lamp Base 23 (LB-23)






Lamp Base 14 (LB-14)


Lamp Base 10 (LB-10)

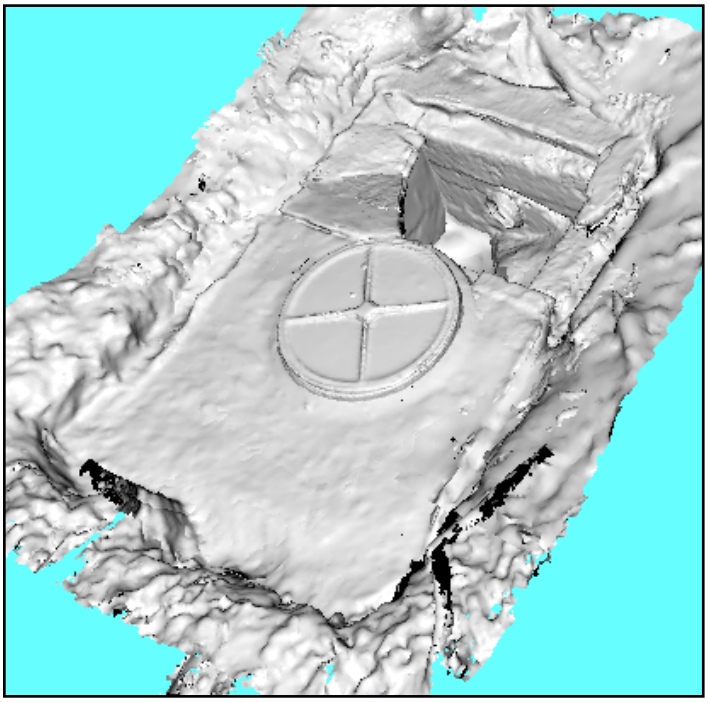

The locations of identified lamp bases. MHM is confident that others lie beneath the surface.
This Lamp Post is Lamp Base 34, located by MHM near the Mystic Chute Ride (ELMHS).

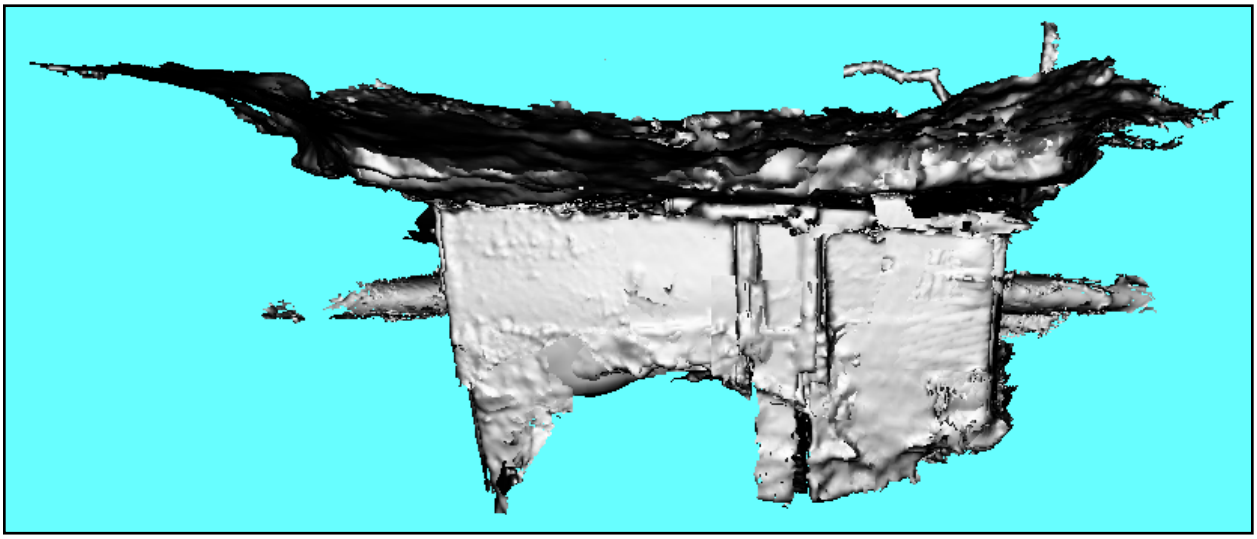
BIAP Water Management

A variety of types of drainage infrastructure were identified in the project area. The most obvious example of water management are the Large Drain and the Pump House described above. However, MHM chronicled several medium size and smaller drainage systems around the island that included silt traps, smaller drains, individual Red Wing clay water pipes, a sturdy concrete and stone midden for boiler security and management, manholes, and slews.

D11: Silt Trap

Six silt traps have been identified in the project area. Silt Trap D11 is the most intact example and MHM thoroughly documented the concrete, metal, and wooden feature, including 3D scanning. Based on the location of D11, it served the Music Casino's drainage needs.

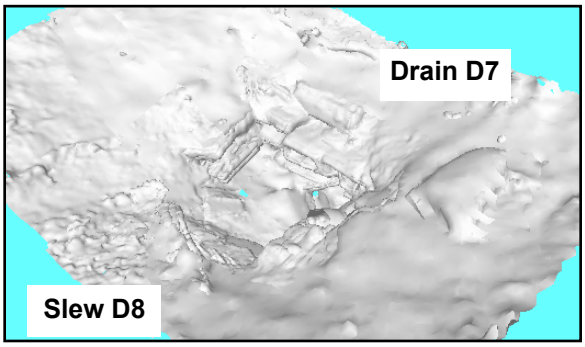


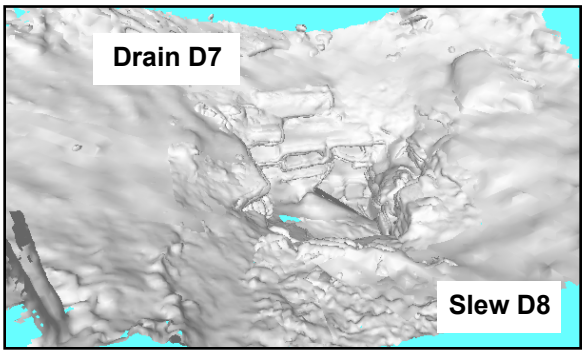


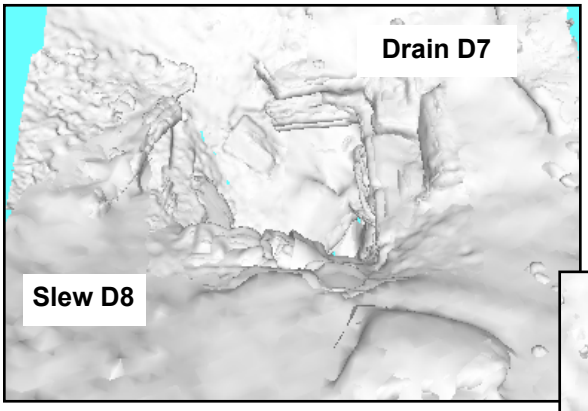
Other Silt Traps

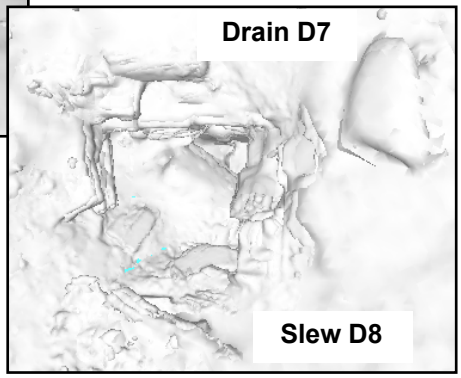
D7: Drain

Five drains and 1 slew have been identified in the project area. Drain D11 is an interesting example of water management for the Restaurant. MHM thoroughly documented the terra cotta tile, concrete, and metal, feature, including 3D scanning. Another water management tool assisted D7 in taking water away from the Restaurant; a slew (D8) was located up-hill from D7 and fed waste water toward the drain.





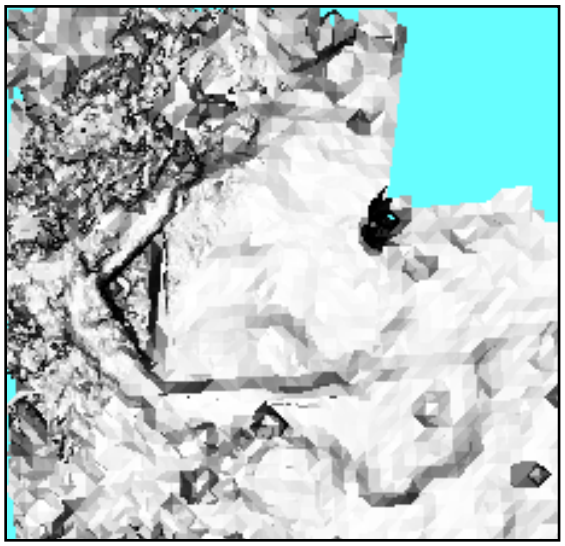




Other Drains

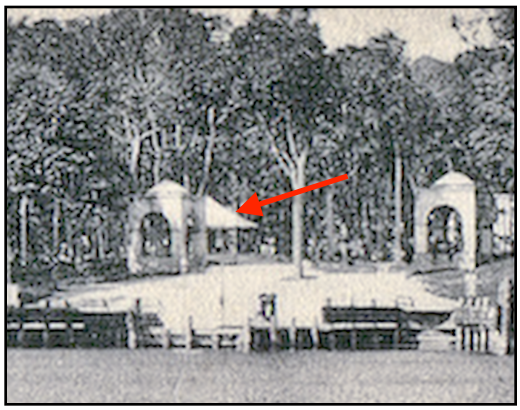
Sealed Infrastructure

MHM identified an unaltered, sturdy, and sealed feature - Sealed Infrastructure -located on a high spot in the project area near the Amusements Building. MHM suspects the feature was part of the electrical system of the BIAP. MHM recorded the feature, took photographs, and 3D scanned the Sealed Infrastructure



Carousel

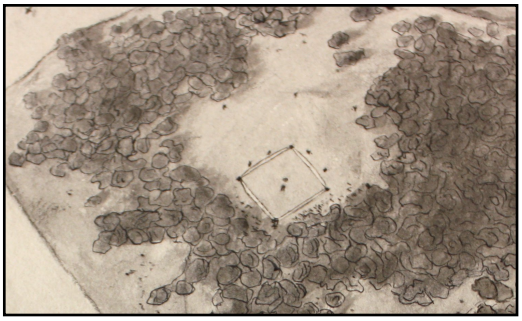
The BIAP Carousel was a small and somewhat portable machine, not the large and elaborate mechanism that usually comes to mind. In 1 photograph, the carousel is located behind the West Gazebo. There is no physical evidence of the Carousel to be found *in situ*.



The Carousel behind the West Gazebo (ELMHS).

Baseball Park

The TCRT constructed a BIAP Baseball Park on the northwest corner of the project area, 'behind' T1 and K1. MHM did not expect to locate any artifacts or evidence of the ballpark - and none was found.



The BIAP Baseball Park (Buffington 1906).

BIAP-BIVC Middens

Several artifact Middens are found all over the project area. Many of them have been linked to particular features, but many of them are cannot be linked to a specific building or construction. The Middens are labeled as BIAP Middens 1-8, BIAP Cliff Middens 1 and 2, a BIAP Pipe, a mixed BIAP-BIVC Midden, BIVC Middens 1-10 (including Farm

Implements, a Metal Plate, 4 Pipes and ribbed flexible plastic drainage tubes, a Golf Ball, and Camp Concrete), BIVC Composite Cones 1 and 2, a BIVC Chair, and 2 Signs on a Tree and on the ground.

BIAP Manholes

Five Manholes (MH1-5), 1 modern example and 4 made of BIAP concrete, are found in different parts of the project area. The concrete versions have been moved about by people for unknown reasons.

BIAP Secondary Boat Docks

Abundant pictorial evidence survives for the existence of 2 small Secondary Boat Docks on the east side of the project area. Physical evidence of 1 of the docks survives in the form of large and long metal girders at the shoreline.

BIAP Berm and RipRap

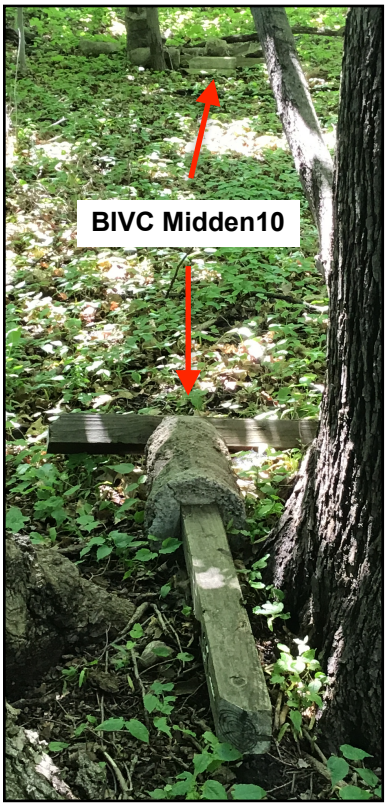
An obvious and large human-made BIAP Berm and RipRap combination was identified on the northeast end of the project area.

Boats

The remains of 2 boats are located on the east side of the project area. Two large metal pontoons with associated galley equipment (oven, stove, many burner covers) are located near the Roller Coaster. To the east of the Swamp Watching Platform, pieces of a cut-up fiberglass boat are spread around the area. One of the pieces is the starboard bow and its registration number survives: MN 1447 BJ. MHM's DNR contact provided the vital statistics for the boat and she was a 1959 Seaflite 16.00' fiberglass vessel, and her last registration expired in December 1981 (John Nordby, personal communication, August 2019). A third boat was on the island 10 years ago, in the swampy area at the western end of the project area. The metal boat was probably moved off the island, but there is a slight chance that it sank into the swamp.

BIVC Camp Sites

In addition to the BIVC Cabins - and they lasted beyond the life of most of the cabins - several Camp Sites were offered to veterans for tent camping. The sites were numbered, were equipped with grills (some of the grill bases were re-used BIAP Lamp Bases), and picnic tables. At some point, many of the camp markers were pulled up and tossed into middens around the island, but some are still in place. MHM recorded the marked camp sites, and those without a number associated with them was given a letter designation. MHM located camp sites V3-V6, V8, V9, V24-V27 and V29, and designated others Va-Vi. MHM also identified 2 middens where the camp site signs were dumped - marked as BIVC Midden10. Lastly, MHM located 5 fire pits (FirePits1-5) that may be associated with camp sites, BBQGrillBases, and 1 PicnicTable marked as belonging to the VFW.



BIAP Zoo

The BIAP had a small Zoo for a time (Maravelas Chapter 10). MHM located some old fence posts near the western edge of the project area that may be remnants of the animal enclosures. However, the Zoo could have moved around the island as needed, so this identification is tentative, and the fence posts could be linked to the Game Farm.

'Other' Modern Objects

Beyond the 'garbage'[16] strewn all over the project area, a modern septic system was installed at some point in the last 10 years or so. As far as MHM can ascertain, no major damage was inflicted on archaeological features; although, a modern pipe was laid down directly through 1 of the Pergola's column bases. Further, 3 modern 'Tree Shelters' are found in different parts of the project area. These invasive structures should be dismantled because they are not entirely harmless; whomever is making them is moving around artifacts, mostly from the BIVC Cabin and artifact middens. These actions are illegal and they must cease.

Two 'Modern Tree Shelters' whose construction disturbed archaeological features and artifacts.

[16]Garbage is a relative term. MHM is not against 'cleaning up' the island, but before any type of clean-up up takes place, archaeologists consultants should be on-hand to determine the context and nature of all human-made objects. MHM established a relative date for a wreck in Prior Lake from a Budweiser beer can on board - so, even 'modern' beverage cans can tell a story. The story must be extracted first, then the artifact can be moved.

Conclusion

The brief terrestrial and underwater archaeological survey and test excavations conducted in 2003 and 2007 on Big Island provided MHM's archaeologists with a basic understanding of the nature of the architectural features and artifact types that might be located during future research. The 2019-BI Project's full Phase I Archaeological reconnaissance survey proved features associated with the Big Island Amusement Park and the Veteran's Camp are more extensive that previously thought. In some cases, archaeological features were exposed on the surface or very near the topsoil. Surface cleaning, shovel testing, and small targeted test trenches as archaeological methods - combined with GPS, 3D scanning, photography, video, triangulation, and measured drawings - were more than satisfactory to accumulate required data. Based on the archaeological questions answered during the 2019 fieldwork - and due to technological improvements - MHM has revised the priorities for the management of cultural resourced in the project area.

Cultural Resource Management Recommendations

Conservation

Now that MHM has confirmed the existence of nearly major construction associated with the BIAP, any future considerations concerning walking path placement, facilities construction, forest management - any activity that might threaten protected archaeological features - must take them into account. Further, the stabilization of archaeological features and artifacts is paramount to the continued survival of these finite cultural resources. Of particular concern is the Archways Wall (A7); it has deteriorated since 2007. Also, the near-destruction of the Plinth near A7 is a criminal act; this type of activity must be stopped in the future.

Preservation

During the fieldwork portion of the 2019-BI Project, MHM was approached by island visitors seeking information about the history of the BIAP and BIVC. All expressed interest in informational kiosks describing the history and archaeology of the island - and many were searching for the cabin grandpa used after World War II - or that they remembered vacationing in as a child. MHM strongly supports the construction of informational displays and signs dedicated to the education of visitors; considerations of their placement must take into account the archaeology, of course, so as to not destroy features and artifacts. It must be noted that a group of ladies spoke with us who were using their cell phones to give themselves a 'guided' tour - a Big Island History app would be well-received.

Recent Criminal Activity

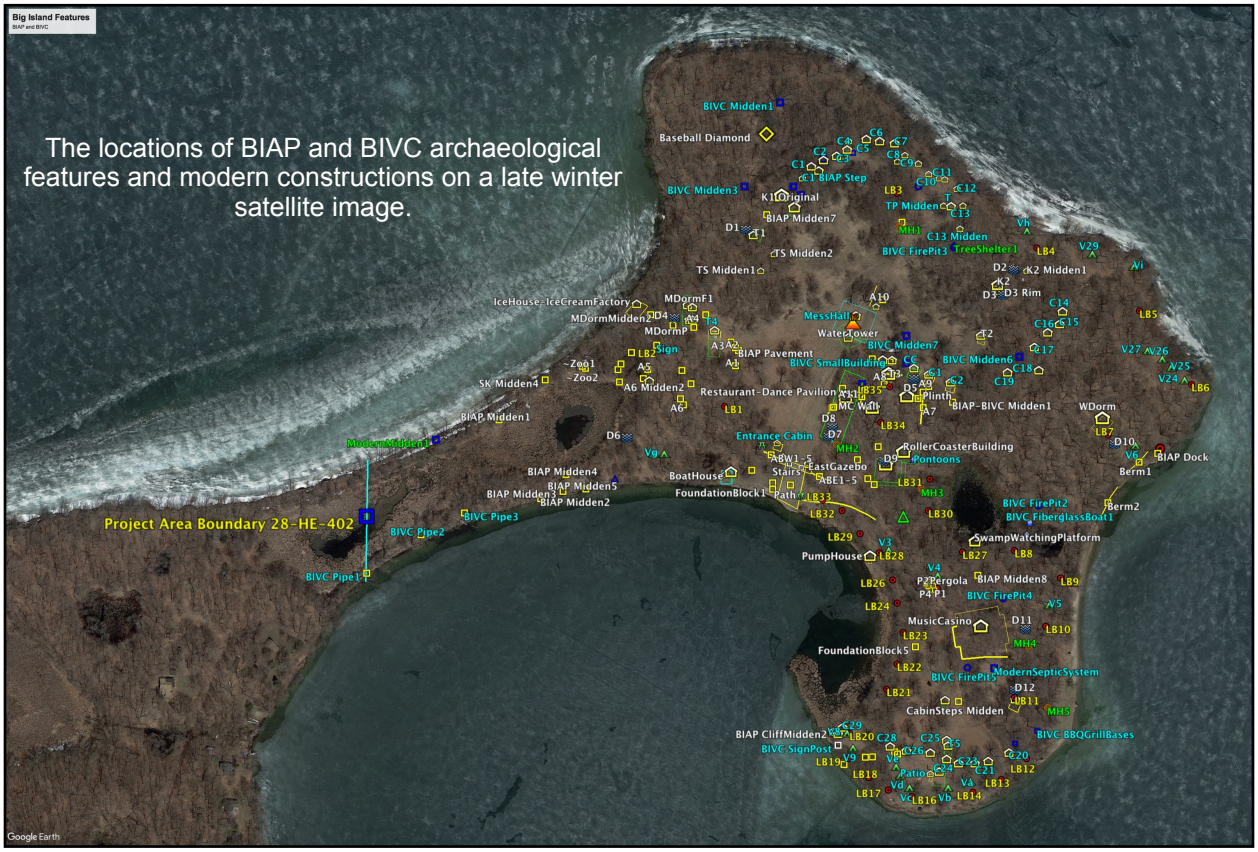
While MHM was conducting fieldwork on the island, 2 men were found to be looting artifacts and disturbing the archaeological site using shovels and metal detectors. MHM approached the men to explain that their actions were illegal; they disagreed, and MHM called the Hennepin County Sheriff's Water Patrol. Just these 2 men with shovels disturbed a significant amount of the site - and MHM has no way to know what artifacts were taken or what features were disturbed.

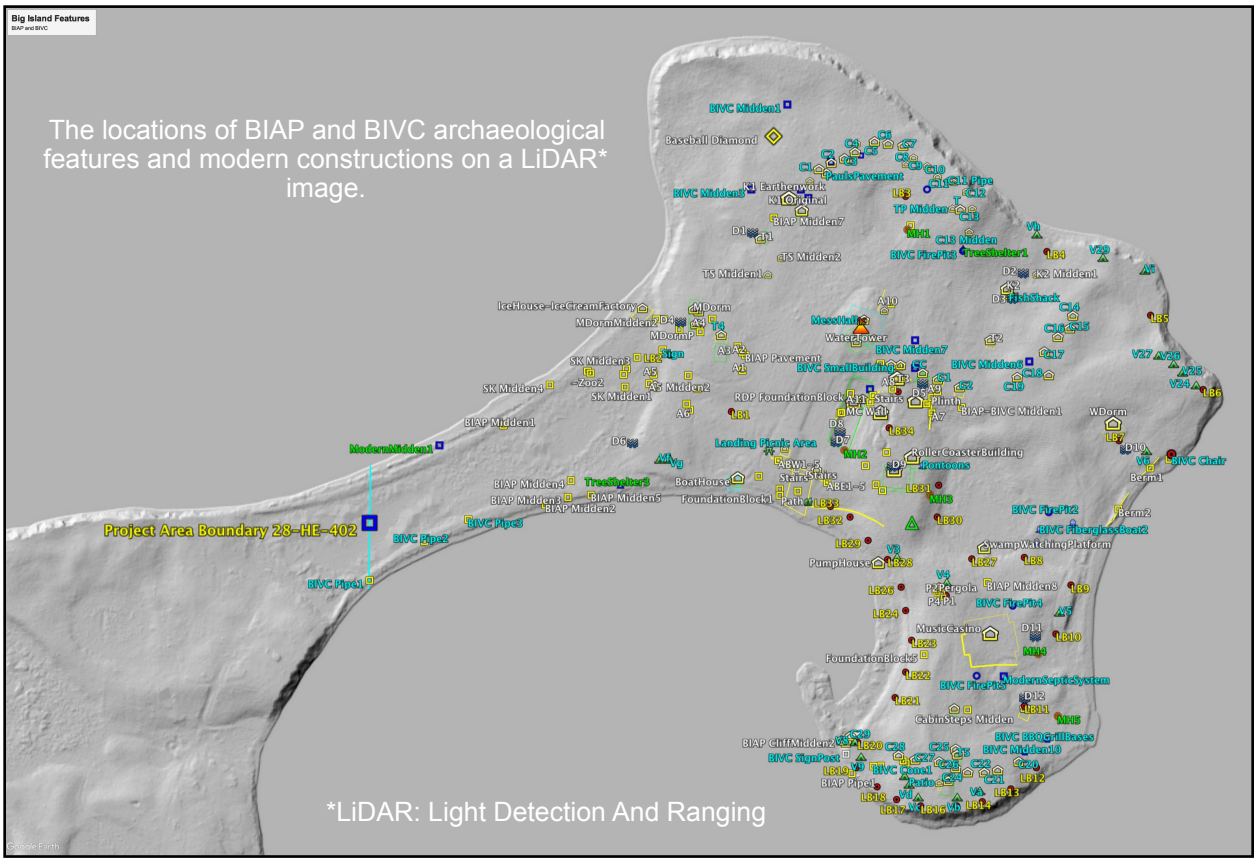
Looter's Holes 2019

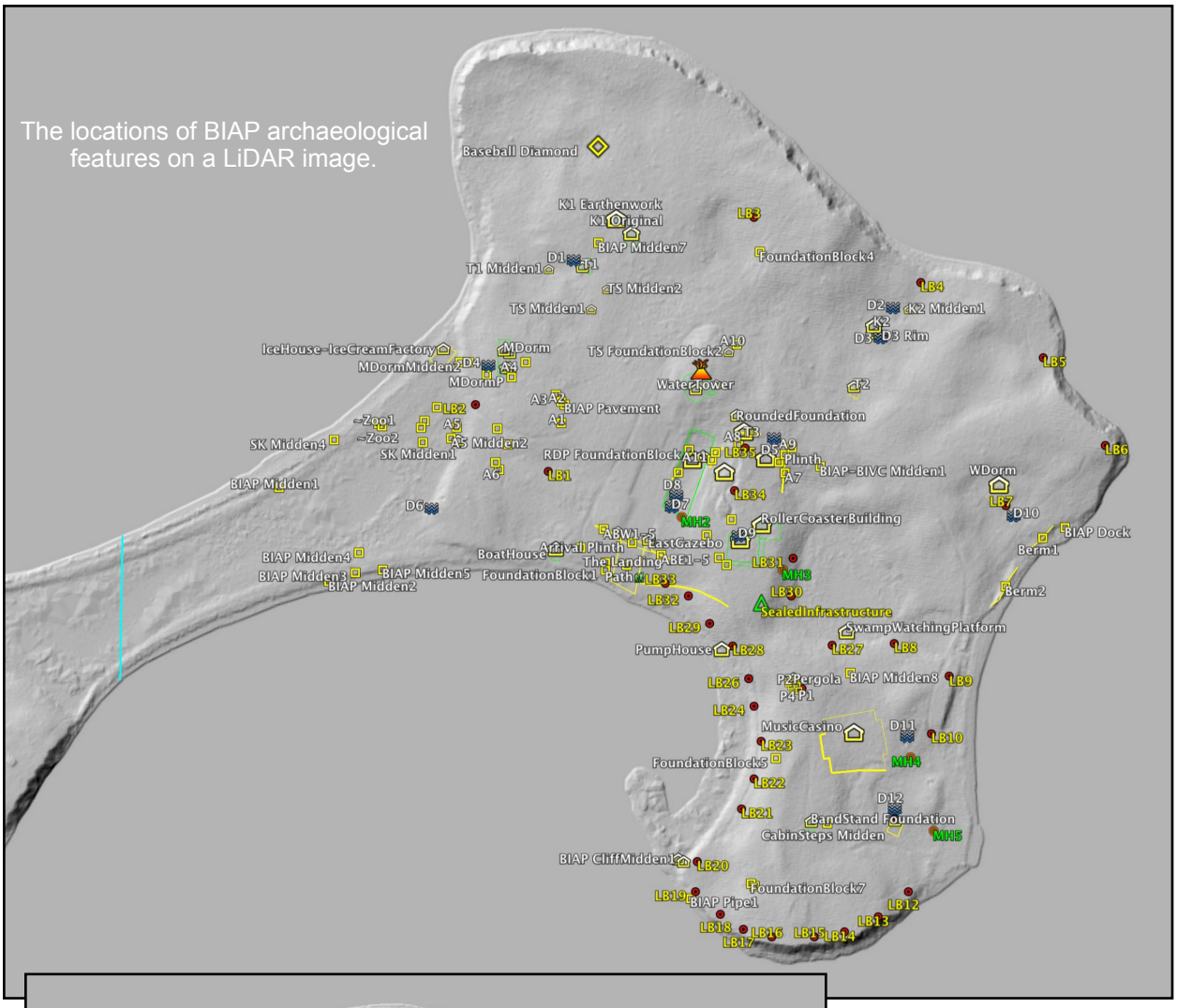
Further, people have been moving artifacts around, probably thinking they are 'helping' by tying a rope to part of a Silt Trap and hanging it on a sign by the Landing. That artifact is now out of context - forever. All archaeological sites are protected at different levels - some at the State level and some at the Federal level - and many at both levels. Currently, the Big Island Steamboat Pier, Amusement Park, and Veterans Camp Site (21-HE-402) is protected by State and Federal laws and acts.

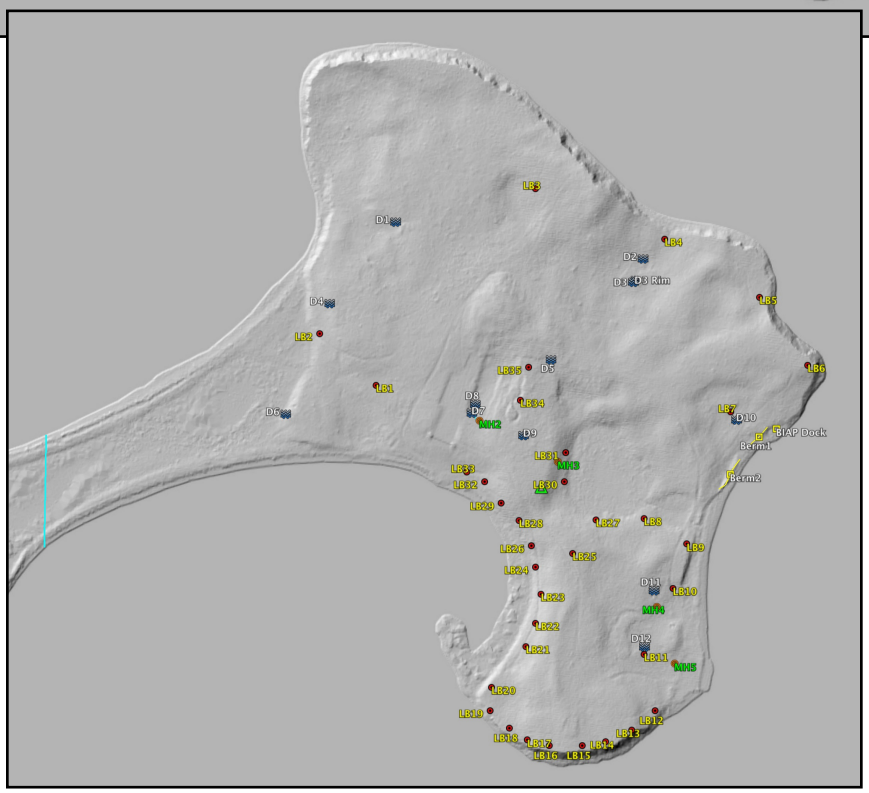
During the fieldwork, MHM completely documented Silt Trap D11 - the most intact silt trap in the project area - and it was covered with branches to prevent people from falling into it. Five days later, MHM found the barrier removed and the broken concrete cover for the feature were tossed all over the area - we assume someone wanted a selfie inside the trap or they were looking for something they considered 'valuable'. Regardless, the care MHM took when documenting D11 inside and out, and the time taken not to disturb the broken cover, was wasted. For now, while MHM replaced the pieces where they 'should' be, they are not where they were when the were *in situ*, undisturbed since 1905.

Maps of the Project Area: Archaeological Features

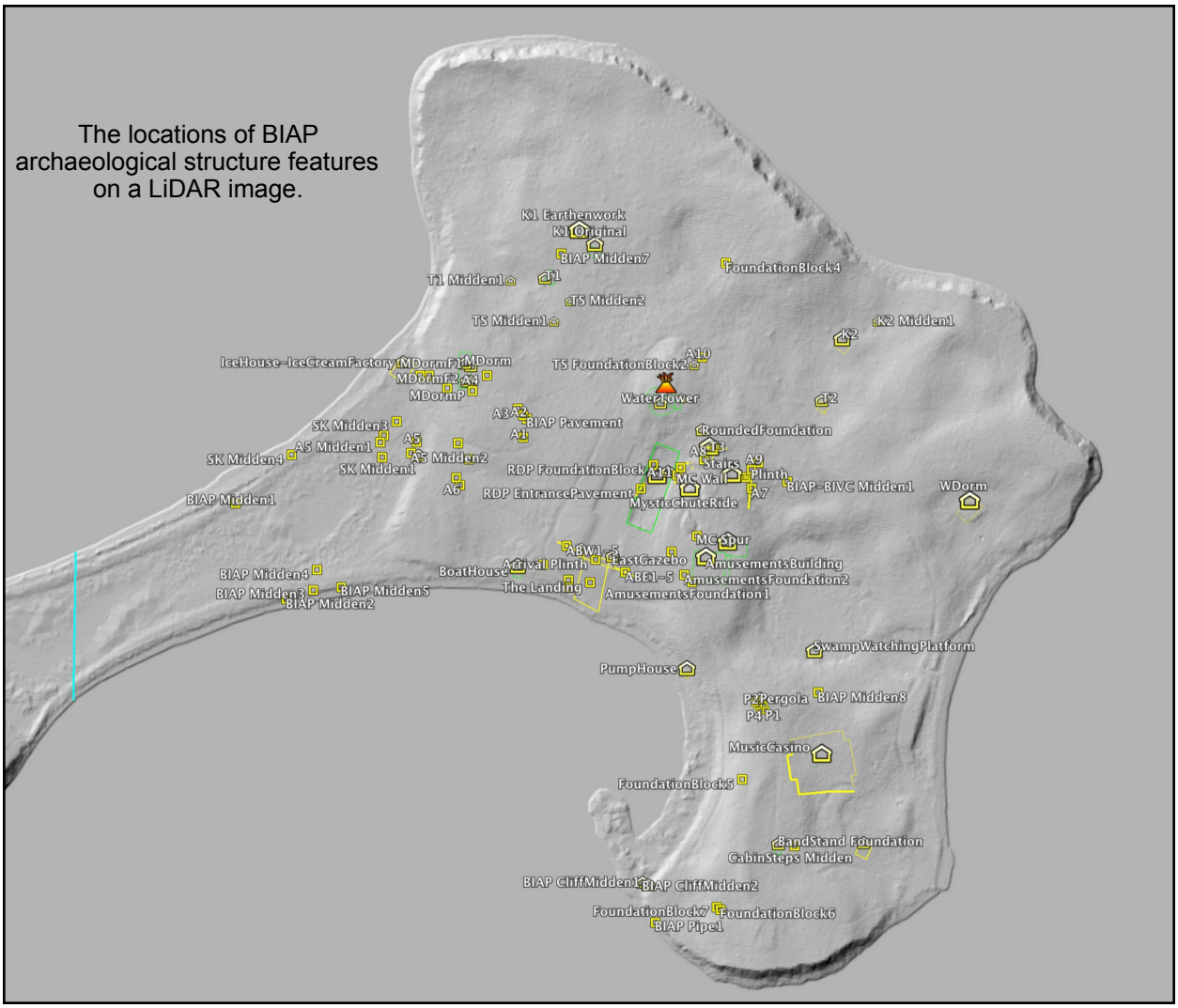




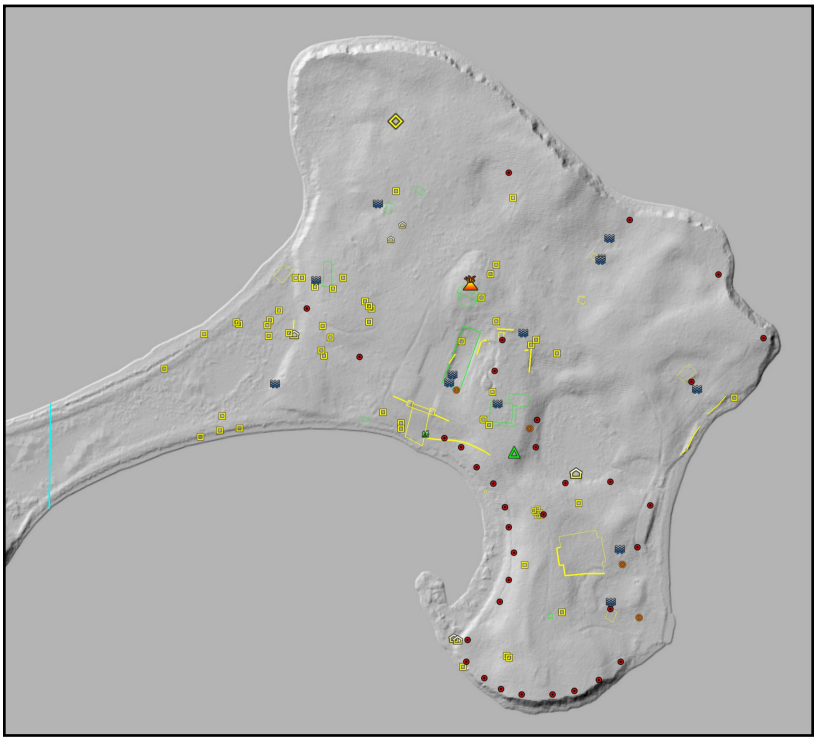




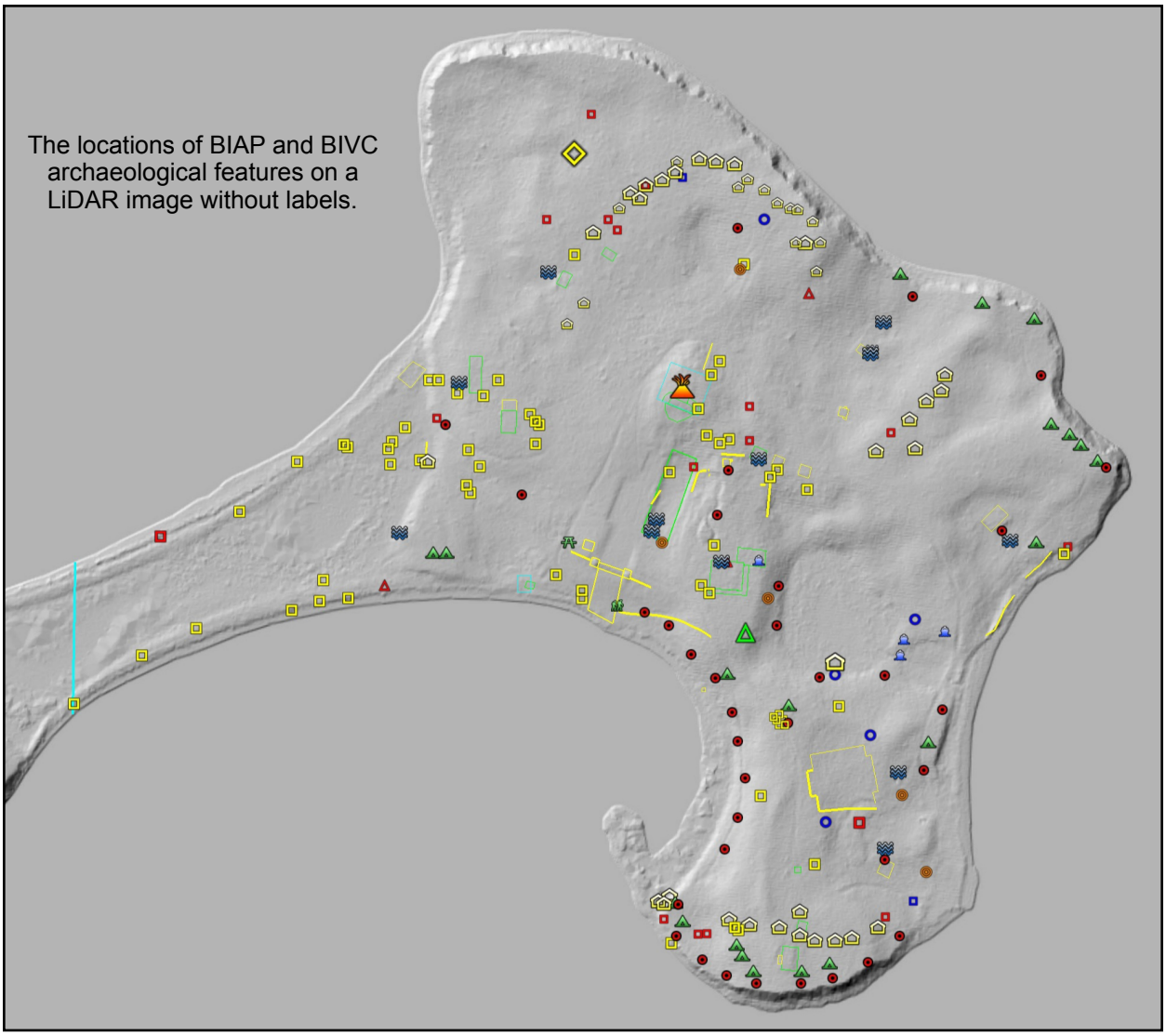
The locations of BIAP archaeological infrastructure features on a LiDAR image.



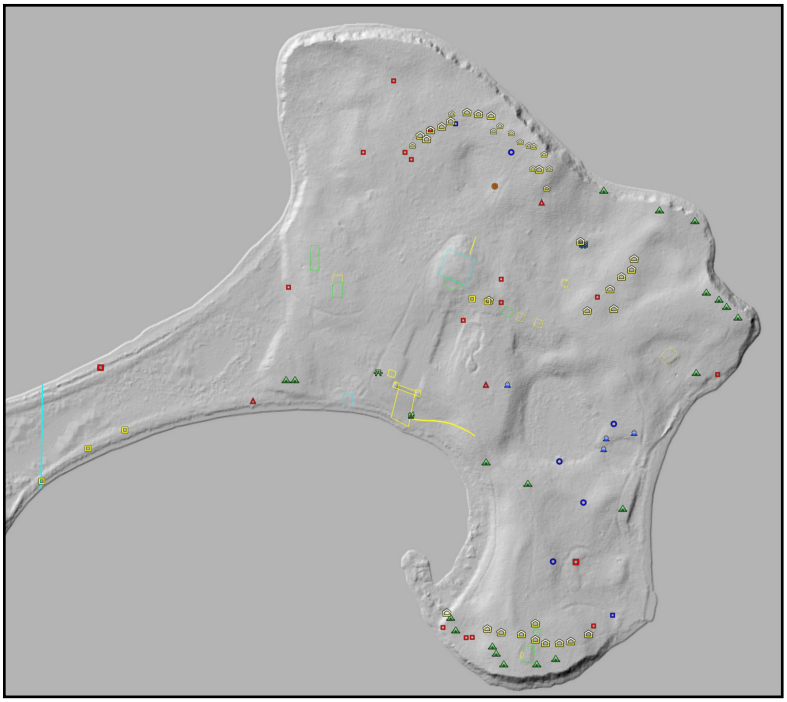
The locations of BIAP archaeological structure features on a LiDAR image.



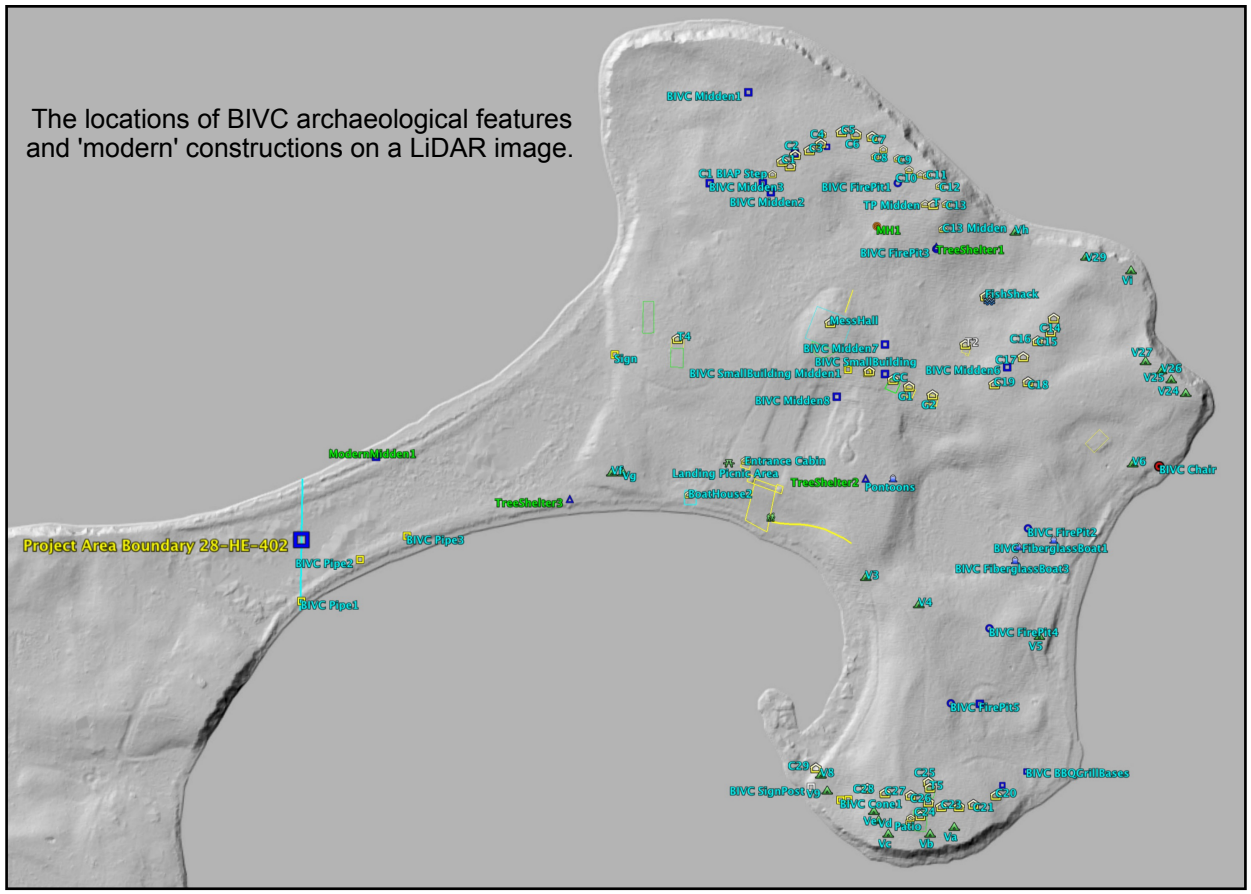
The locations of BIAP archaeological features on a LiDAR image without labels.



The locations of BIAP and BIVC archaeological features on a LiDAR image without labels.



The locations of BIVC archaeological features on a LiDAR image without labels.

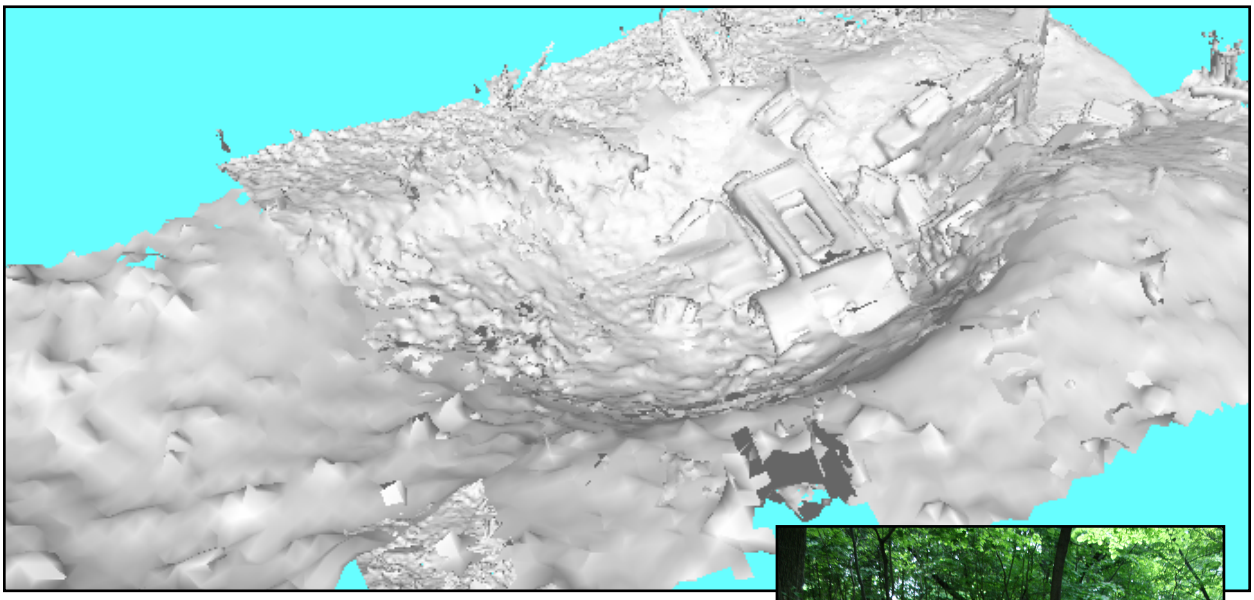

The locations of BIVC archaeological features and 'modern' constructions on a LiDAR image.
BIVC Midden1
BIVC Midden3
BIVC Midden2
BIVC FirePit1
TP Midden
BIVC FirePit3
TreeShelter1
MessHall
BIVC Midden7
BIVC SmallBuilding
BIVC SmallBuilding Midden1
BIVC Midden8
BIVC Midden5
Sign
ModernMidden1
Entrance Cabin
Landing Picnic Area
TreeShelter2
Pontoons
BoatHouse2
TreeShelter3
BIVC Chair
Project Area Boundary 28-HE-402
BIVC Pipe3
BIVC Pipe2
BIVC Pipe1
BIVC FirePit2
BIVC FiberglassBoat1
BIVC FiberglassBoat3
BIVC FirePit4
BIVC FirePit5
BIVC BBQGrillBases
BIVC SignPost
BIVC Canoe1
Patio
Big Island LiDAR image.
800 ft
N

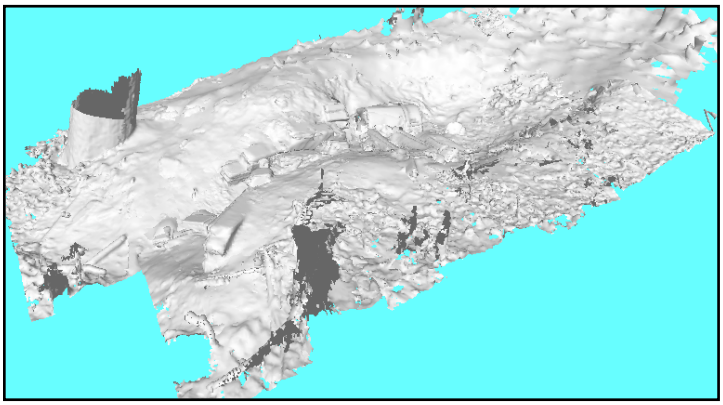
Appendix: Additional Feature Photographs

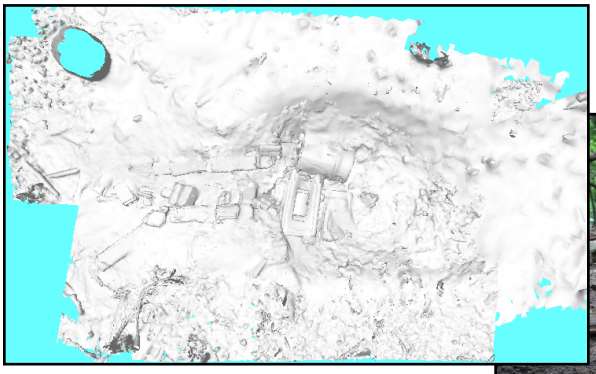
BIAP Mission Revival Archways: ABW 1-5, ABE 1-5, A2, A3

BIAP Mission Revival Archways: A4, A5, A6, A9, A10, BIAP Pavement

BIAP Infrastructure: Large Drain







BIAP Men's Dormitory MDormF1, MDormP, Middens 1-3

BIAP Ice House and Ice Cream Factory

BIAP-BIVC Toilet 1

Cabin 9
2007

Cabin 9
2019

Cabin 10
2007

Cabin 10
2019

Cabin 11
2007

Cabin 11
2019

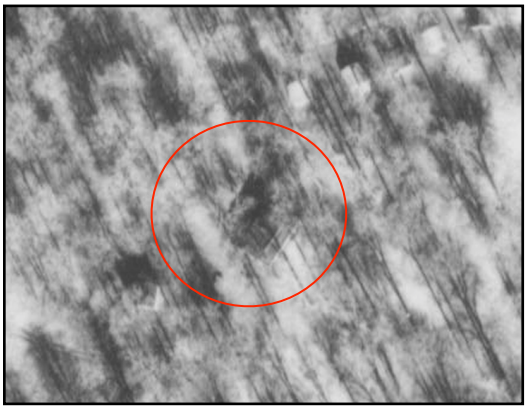
The only archaeological evidence of C12 that survived in 2007 was a re-used BIAP step. This step had been moved by 2019 and is part of Feature TP Midden below.

Cabin 13 and the Trailer
2007

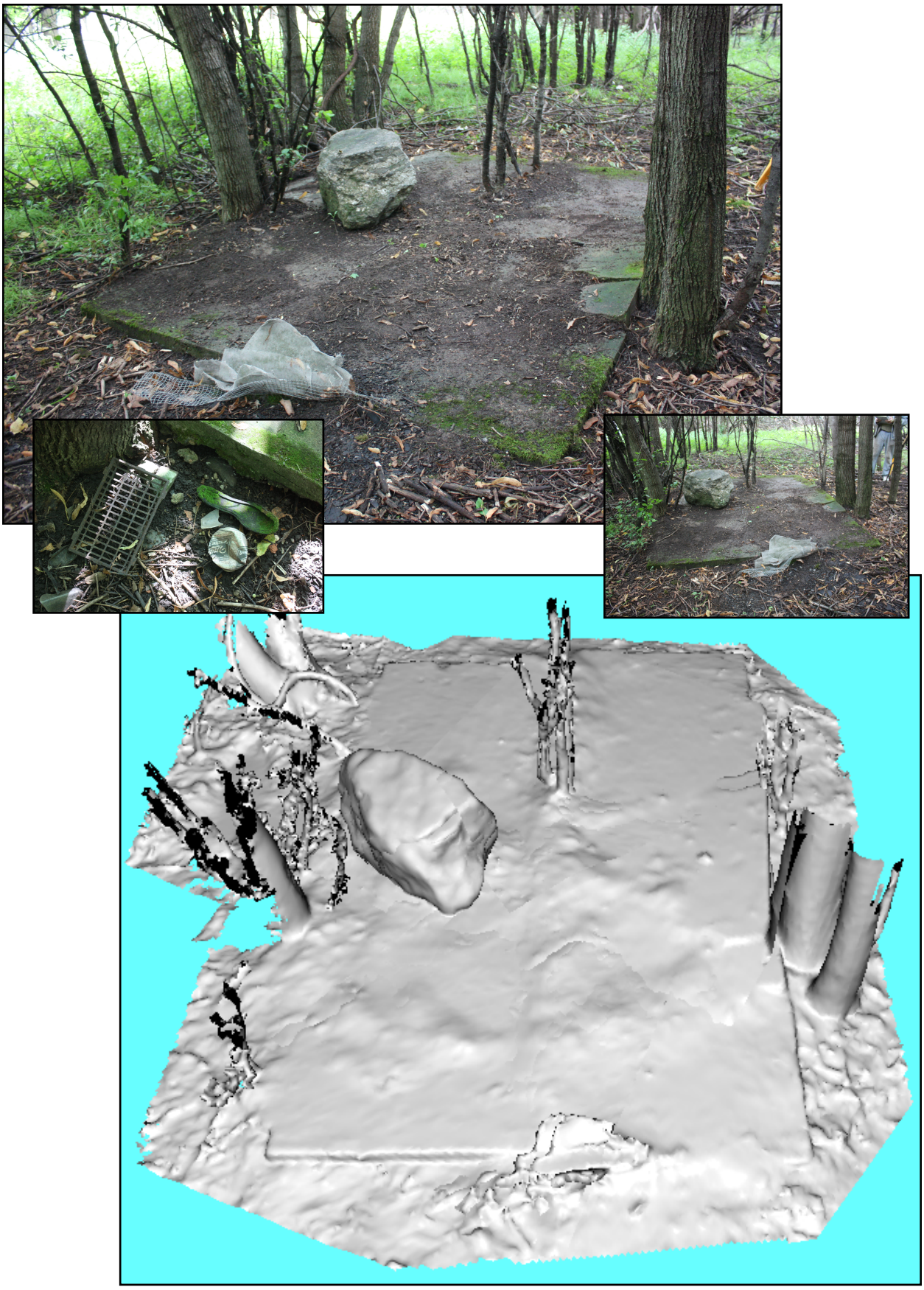
Cabin 13
2019

TP
Midden

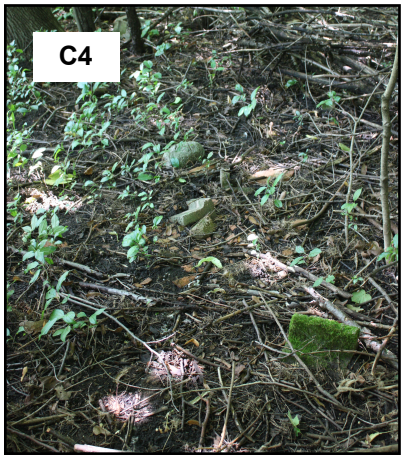
BIAP Picnic Kitchen 1

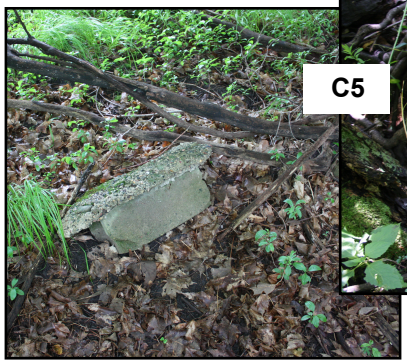


BIVC Paul's Pavement

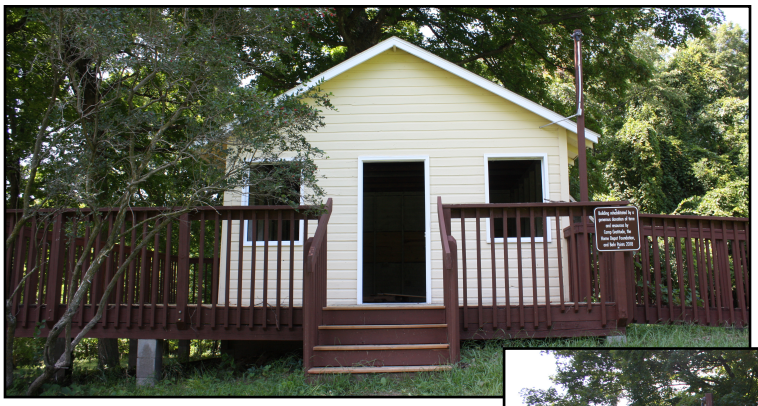


BIVC Cabins

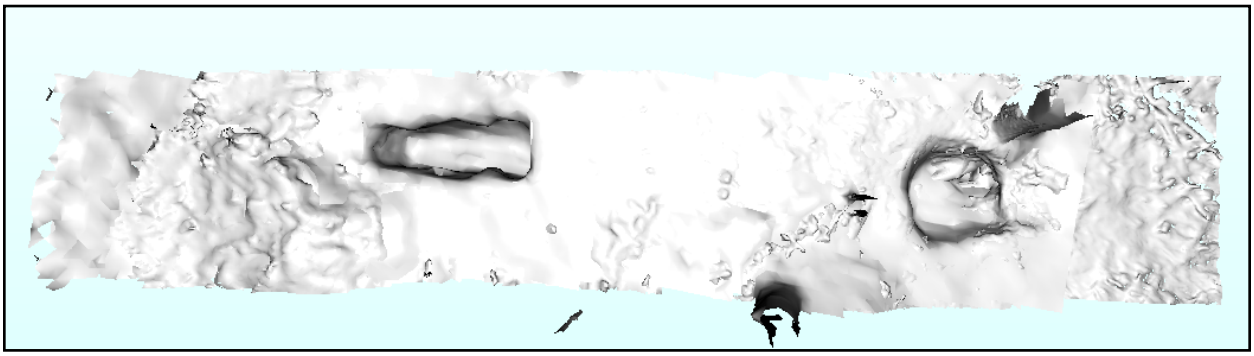


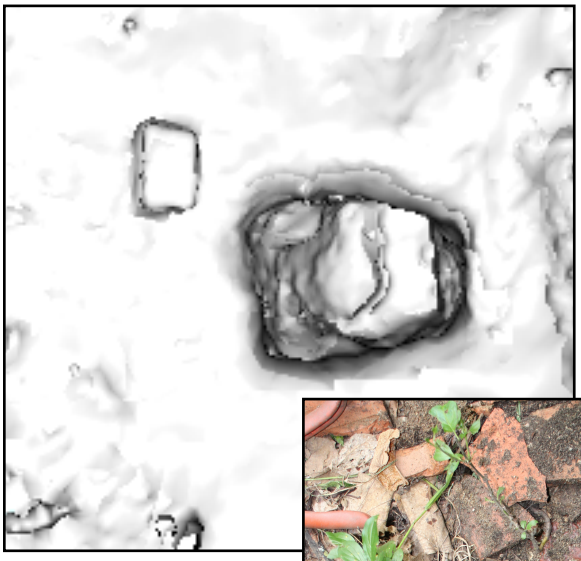


Cabin at The Landing
2019

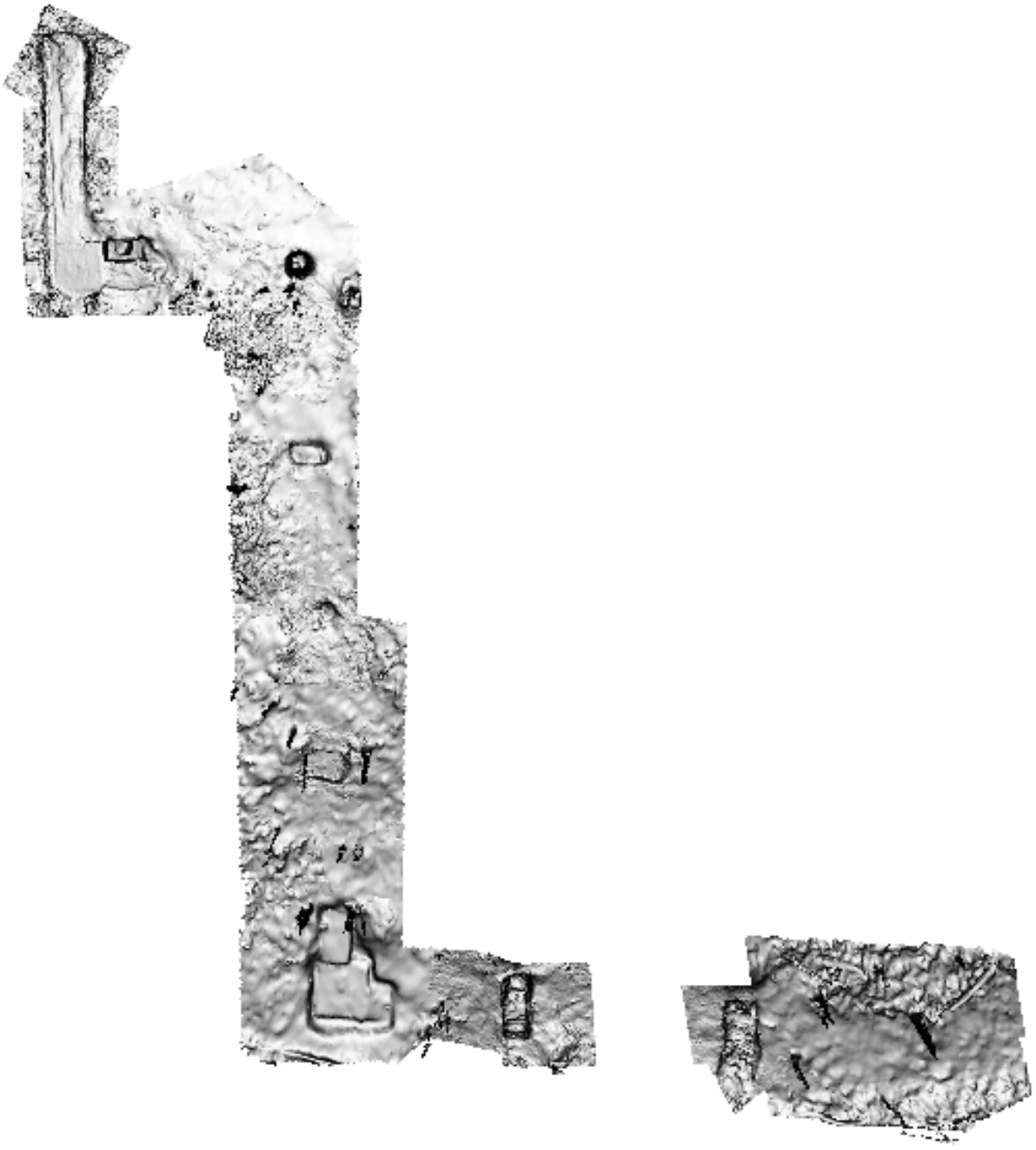


BIAP Music Casino





BIAP Music Casino



BIAP Additional Lamp Bases

LB1

LB2

LB3

LB4

LB5

LB6

LB7

LB8

LB9

LB11

LB12

LB13

LB15

LB16

LB17

LB18

LB19

LB20

LB21

LB22

LB24

LB25

LB26

LB27

LB28

LB29

LB30

LB31

LB32

LB33

LB34

LB35

Another view of the complete Lamp Base 23.

References

Anfinson, Scott F. 1997. *Southwestern Minnesota Archaeology: 12,000 Years in the Prairie Lake Region.* Minnesota Historical Society: St. Paul, MN.

Arzigian, Constance, and Katherine Stevenson. 2003. *Minnesota's Indian Mounds and Burial Sites: A Synthesis of Prehistoric and Early Historic Archaeological Data.* Publication 1. Office of the State Archaeologist: St. Paul, MN.

Atwater, Isaac, and John H. Stevens, eds. 1895. *History of Minneapolis and Hennepin County, Minnesota.* Munsell Publishing Company: New York.

Braley, Duane. 1965a. *The Bergs*. Minneapolis Star Tribune Photographs Arranged by Subject. Minneapolis, St. Paul, and Edina Newspaper Collection. Minnesota Historical Society: St. Paul, MN.

_____. 1965b.*Sunbathers*. Minneapolis Star Tribune Photographs Arranged by Subject. Minneapolis, St. Paul, and Edina Newspaper Collection. Minnesota Historical Society: St. Paul, MN.

Brown, Sylvia Holmes. 1926. *Autobiography of Sylvia Holmes Brown, daughter of John H. Holmes.* Minnesota Historical Society, Manuscripts Collection: St. Paul, MN.

Cooley, George W. 1879. *Map of Lake Minnetonka*. Warner and Foote: Minneapolis, MN.

Daily Ardmoreite. 1921, 28 June.

Drewry, Chip. ND. *Men's Bunk House*. Image cropped by MHM because of space considerations. https://www.flickr.com/photos/64088587@N00/4642303378/in/album-72157624016889603/

Dunwiddie, Foster W. 1975. The Six Flouring Mills on Minnehaha Creek. *Minnesota History*, 44: 162-174.

Edward A. Bromley Collection. Hennepin County Library: Minneapolis, MN

Elwell, Terry and James Elwell. 1975. Big Island Park Part II: Rise and Demise of a Short-Lived Recreation and Entertainment Center. *Hennepin County History,* Vol. 34, No. 3: 15-17.

Excelsior-Lake Minnetonka Historical Society. Photograph Collection. Excelsior, MN.

Gibbon, Guy. 2003. *The Sioux: The Dakota and Lakota Nations.* Blackwell Publishing: Malden, MA.

Glasgow Courier. 1921, .8 July.

Great Falls Tribune. 1921, 29 June.

Grim, George. 1965. "'Tonka Jewel' Now a Vacation Setting". *Minneapolis Tribune,* 18 July.

Hennepin County Property Records. *Interactive Map*. https://gis.hennepin.us/property/map/default.aspx

John R. Borchert Map Library. 1937-1971. University of Minnesota: Minneapolis, MN.

Johnson, Elden. 1988. *The Prehistoric Peoples of Minnesota.* Revised Third Edition. Minnesota Historical Society Press: St. Paul, MN.

Keating, William H. 1825. *Narrative of an Expedition to the Source of St. Peter's River, Lake Winnepeek, Lake of the Woods, &c.* Vol. 1. George B. Whittaker: London.

Kloss, Julie A. 2005. *Sweatt Site Form 21-HE-353.* On File at the Office of the State Archaeologist, Fort Snelling: St. Paul, MN.

L.S. Buffington Papers. 1905-1907. Northwest Architectural Archives, Archives and Special Collections, Elmer L. Andersen Library, University of Minnesota: Minneapolis, MN.

Little Falls Herald. 1921, 8 July.

Log Cabin Democrat. 1921, 28 June.

Maravelas, Paul. Forthcoming. *History of Big Island Lake Minnetonka*. Draft. July 2019.

Maritime Heritage Minnesota. Postcard Collection. Maritime Heritage Minnesota: St. Paul, MN.

Merriman, Ann and Christopher Olson. 2012. *Lake Minnetonka Survey 1Project Report*. Maritime Heritage Minnesota: St. Paul, MN.

Metcalf, Isaac S. 1855. *Letter from Isaac S. Metcalf to his wife. July 12.* Letters of Isaac. S. Metcalf. Minnesota Historical Society: St. Paul, MN.

Minneapolis Journal. 1906, 19 February.

Minnesota Historical Society. *Photograph Collection*. Gale Library: St. Paul, MN.

Minnetonka Record. 1906a, 20 July; 1906b, 3 August; 1906c, 10 August.

Neill, Edward Duffield. 1858. *The History of Minnesota: From the Earliest French Explorations to the Present Time.* J. B. Lippincott & Co.: Philadelphia, PA.

New Ulm Review. 1921, 6 July.

Nienow, Jeremy L. 2004. A Preliminary Analysis of Middle and Late Woodland Ceramics from 21HE210 and 21HE211 on the Halsted Bay Peninsula, Lake Minnetonka, Minnesota. *The Minnesota Archaeologist*, 63: 29-42.

Nelson, Tim. 2015. "The State Fair's Ye Old Mill turns 100 years old". *MPR News*. 6 August. https://www.mprnews.org/story/2015/08/06/ye-old-mill-state-fair

_____. 2018. "State Fair buys Ye Old Mill from founder's descendants". *MPR News*. 15 January. https://www.mprnews.org/story/2018/01/15/state-fair-buys-ye-old-mill-from-founders-descendants

Northwestern Democrat. 1856, 19 January.

Office of the State Archaeologist Site Files Portal. *Site Forms for 21-HE-94, 21-HE-30, 21-HE-458-21-HE-462, 21-HE-ad*. On file at the OSA. St. Paul: MN.

Olson, Russell L. 1976. *The Electric Railways of Minnesota*. Minnesota Transportation Museum, Inc.: Hopkins, MN.

Sanborn Map Company. 1912. *Insurance Maps of Minneapolis, Minnesota*. Volume 6. Sanborn Map Company: New York, NY.

State Game and Fish Commissioner. 1916. *Biennial Report of the State Game and Fish Commissioner of Minnesota*. Syndicate Printing Company: Minneapolis, MN.

Storrs, Caryl B. 1917. "Visitin' 'Round in Minneapolis". *Minneapolis Morning Tribune*. 19 January.

Terrell, Michelle. 2015. *Woodland Lifeways on the Shores of Mni Tanka: Archaeological Mitigation for the Woodland Cove Project, Minnetrista, Hennepin County, Minnesota.* Two Pines Resource Group: Schafer, MN.

Twin City Rapid Transit Company. *Corporate Records*. Minnesota Historical Society: St. Paul, MN.

_____. 1907. *Beautiful Big Island Park Lake Minnetonka*. Tribune Printing Company: Minneapolis, MN.

Upham, Warren. 1920. *Minnesota Geographical Names: Their Origin and Historic Significance.* Minnesota Historical Society: St. Paul, MN.

U.S. Surveyor General's Office. 1854. *Original Land Survey Maps of Minnesota Collection.* General Land Office: Washington, DC.

Warnock, A. W. 1909. "The Story of Beautiful Big Island Park and Lake Minnetonka", *Street Railway Journal*, Vol. XXXI, No. 4: 106-110.

Wedel, Mildred Mott. 1981. The Ioway, Oto, and Omaha Indians in 1700. *Journal of the Iowa Archeological Society*, 28: 1-13.

Westonka Historical Society. *Photograph Collection*. Mound, MN.